MECCANO MAGAZINE

NOVEMBER 1924

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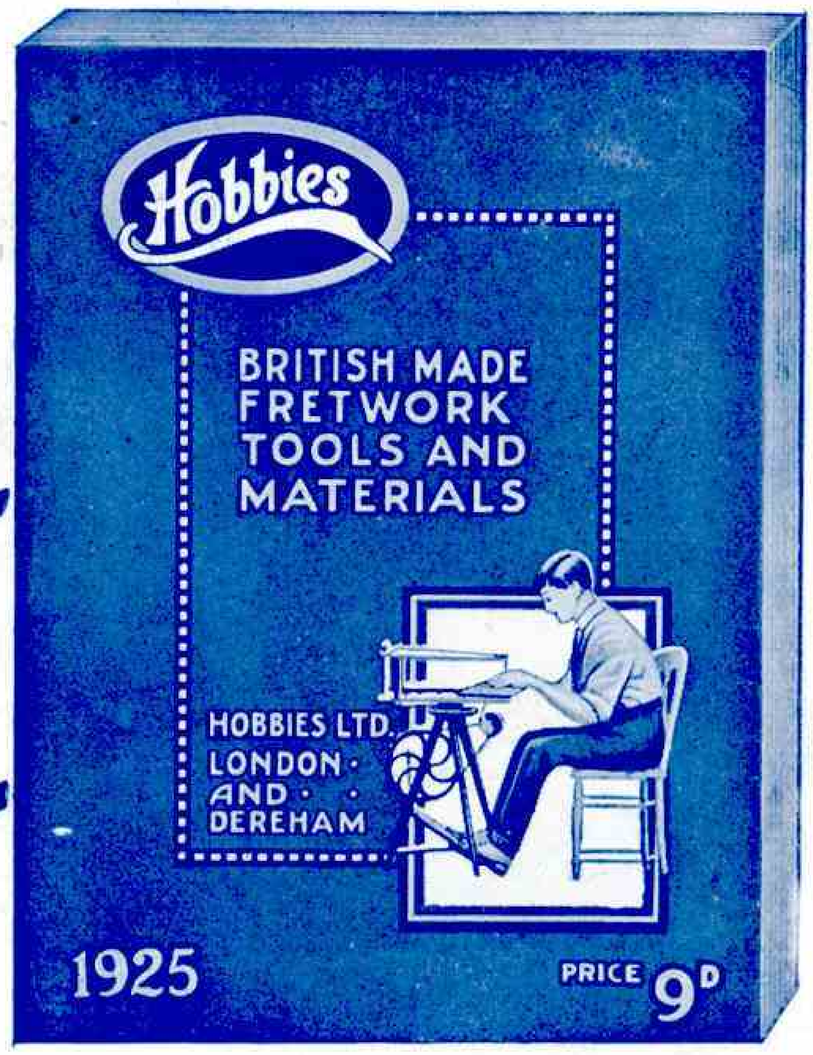
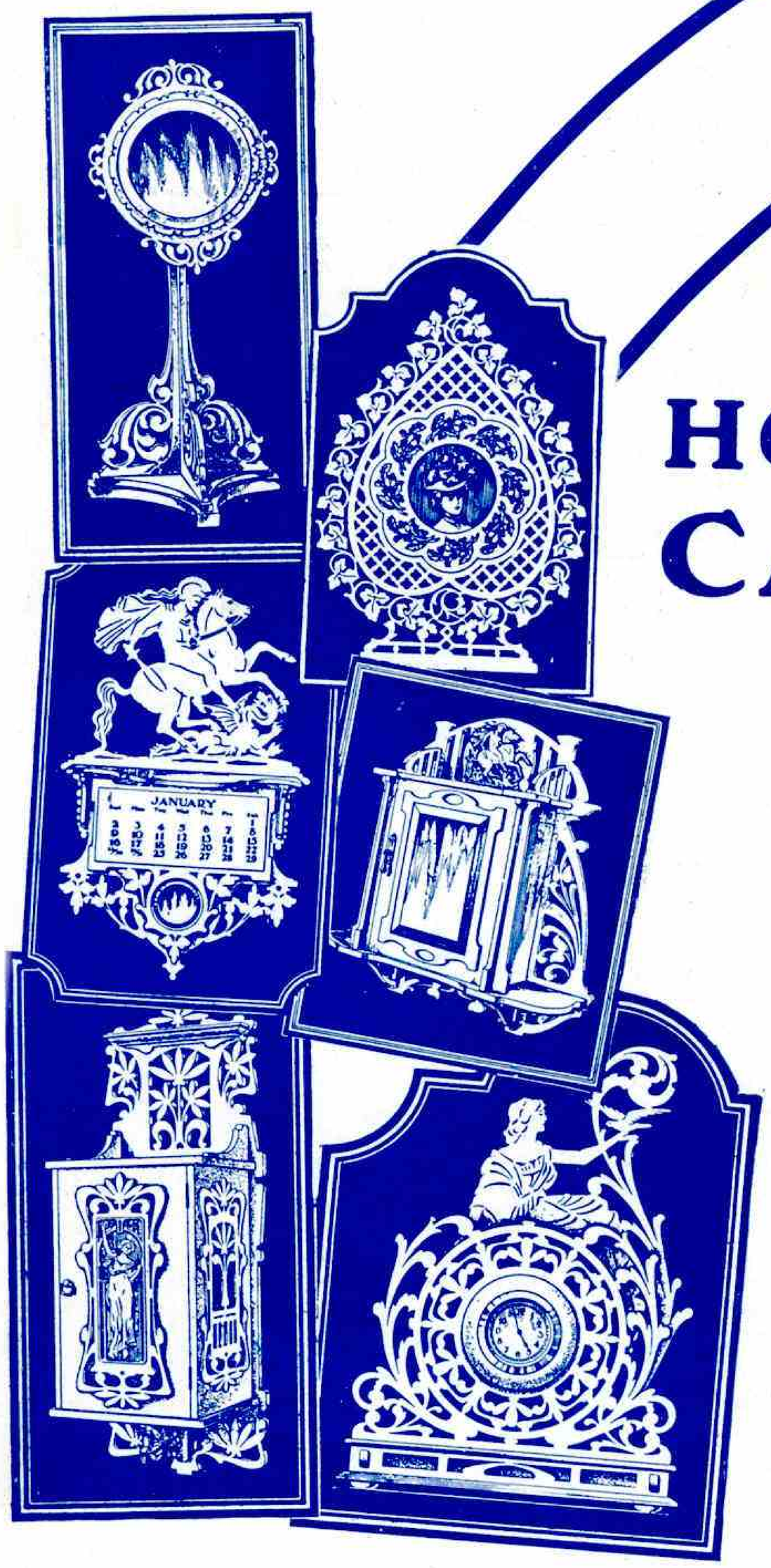
VOL. IX
No 11

MAGNETS IN INDUSTRY
(see page 322)

640 Designs are illustrated in this top-hole Catalogue





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MECCANO MAGAZINE

PUBLISHED
IN THE INTERESTS
OF BOYS

Vol. IX, No. 11.

November 1924

Our Cover

OUR cover this month shows one of the many applications of the electro-magnet in industry, and requires very little description. A travelling overhead crane is lifting a huge casting by means of an electro-magnet. Electric cranes of this type are in everyday use in engineering shops, and prove themselves to be very helpful in saving time and labour. The method of operation is quite simple. When it is desired to move a casting or a steel billet from one part of the works to another, all that is necessary is for the electro-magnet to be brought over the casting to be moved. This magnet is not permanently magnetised, of course, but only becomes a magnet when the current is switched on. With the current switched off, the magnet is lowered to the casting. Then the crane-man switches on the current, the coils in the magnet are immediately energised, and the casting is attracted with such strength that it may be lifted and transported elsewhere. Until the crane reaches the spot where it is desired to deposit the casting, the switch remains "on" and the current continues to pass through the coils of the magnet. When the load has been lowered, the current is switched off and the magnet at once releases its load. This ease of picking-up and releasing a load saves a great deal of the time required to manipulate the chains and hooks necessary with the ordinary type of crane. The electro-magnetic crane has many other advantages also, as for instance when lifting bolts or metal scrap. On this work the magnet attracts large quantities of the loose metal, thus eliminating the necessity for loading by hand. Further details of the application of magnets to industry are given in our article on this subject.

Special Christmas Number

As was the case last year, our December issue will be a Special Christmas Number in every sense of the word. The number of pages will be increased and there will be several very attractive features. These will include the first of a new series of articles on models—on altogether original lines—that may be constructed with a No. 1 Outfit. The cover will be specially attractive and will show a huge pulley in mid-air. A special article, written by an expert engineer, will explain "*Pulleys and How they Work.*" There will also be included a short engineering story entitled "*Two Minutes Slow,*" which I think will prove of great interest to our readers. Railways will be represented by a special article "*Driving an Express Train,*" and Radio by "*Saving Lives at Sea by Wireless.*" There will be further instalments of our regular features—the life of Telford will be continued; the electrical article will deal with Electric Bells, Indicators and Burglar Alarms, which article, I may here remark, has been "crowded out" this month. In addition, the Stamp Collecting, Meccano Guild and Fireside Fun pages will be strengthened. There will be several other noteworthy features, not the least interesting of which will be the instructions for building the revised model of a High-Speed Ship-Coaler—an article that has been anticipated for a long time, and for which there has been a considerable demand. I have always thought that this is one of the most interesting of our Meccano models, for all the movements for coaling a miniature ship are controlled from the gear-box. The High-Speed Ship-Coaler will appeal to every Meccano boy, because when it has been built it affords endless fun, and no little dexterity is required for its operation. There are so many movements that the operator has to use his intelligence and has to be quick with his fingers in order to carry out all of them successfully.

Order Your Copy Now

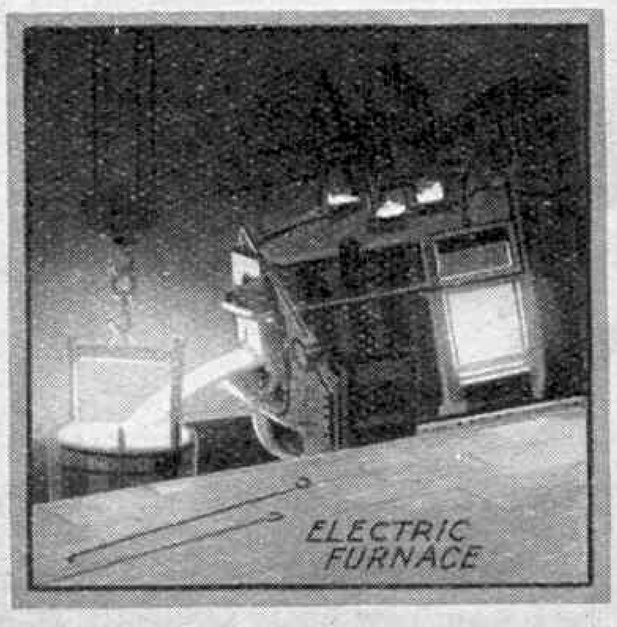
The Christmas Number will be ready on the 1st December, and readers are asked to note that the price will be increased to 3d., post free 4d. Our regular subscribers will, of course, be debited with the increased price, which point they should bear in mind when their subscriptions are due for expiry. Now, there is certain to be a very large demand for this Special Christmas Number, and as the number we print is limited to the number of orders we receive beforehand from our dealers and newsagents, it is very desirable that you should place an order for your copy now. If you have not already placed your order you will avoid disappointment and will assist me also by going to your Meccano dealer or your newsagent right away, and ordering the December issue of the "*M.M.*"

Hints for Competitors

I hope we shall have a record entry for our new Essay Competition, announced elsewhere in this issue, in connection with our series of articles "*How to Run a Miniature Railway System.*" I should like to take this opportunity of drawing the attention of intending competitors—and, incidentally, of my numerous correspondents also—to the value of introducing neatly-executed sketches in their essays and letters when this is possible. I frequently receive letters from readers advancing some theory or describing a mechanism but I often find it impossible to understand these on account of some confusion in a sentence or something omitted. In such cases had sketches been sent as well as descriptions, everything would probably have been quite clear. Sketches encourage readers to develop the habit of making drawings of any mechanism in which they are interested, and there is no better method of securing a thorough grasp of every detail than by drawing it. Sometimes boys tell me "I would have sent a sketch but I have no drawing ability." It is quite true that many boys are not able to draw a landscape or a portrait, but surely every Meccano boy can make a drawing of a piece of mechanism, provided he understands its construction. Perhaps he will not be able to turn out a workman-like scale drawing without tuition, but he can at least produce a sketch that will show all the essential parts of the mechanism. To any boy who thinks he cannot do this I give one word of advice: "Try." I venture to assert that after a few serious attempts he will be agreeably surprised at his progress.

Replacing Damaged Parts

Now that a new Meccano season has commenced, I take this opportunity of reminding my readers that damaged or rusty Meccano parts may be replaced at any time by bright new parts at half list prices. The old parts should be returned either through your regular dealer or direct to Meccano Limited, Binns Road, Liverpool. In the latter event your parcel should be addressed to "Returns Department," and should be accompanied by a list of the parts enclosed and a remittance covering the cost of new parts, based on half current list prices, plus postage. This is a good opportunity for all Meccano enthusiasts to overhaul their Outfits, and so ensure that the models they build during the coming months will not be defaced by broken or rusty parts.



Electricity

IX. MAGNETS IN INDUSTRY

IN the article under this heading in our July issue we described how a rod of soft iron may be made into a magnet by winding round it a number of turns of insulated wire and passing an electric current through the wire. We showed further that the iron has magnetic powers only while the current is flowing. Magnets made by the passage of an electric current are called "electro-magnets" and they play a very prominent part in present-day industrial processes.

Lifting Great Masses of Metal

The most obvious industrial application of electro-magnets lies, of course, in the lifting of heavy masses of iron and steel. In steel mills, iron foundries, machinery factories, shipyards, etc., a considerable amount of time is spent each day in moving masses of metal from one place to another. Cranes of various types, ranging from the small portable crane to the huge electrically-driven overhead travelling crane, are installed to facilitate the handling of the metal. In the ordinary way, their use involves a considerable amount of accessory mechanism such as chains, ropes, grappling hooks, etc. If a crane is fitted with an electro-magnet, however, these accessories at once become unnecessary. The magnet is lowered on to the load it is required to lift, the electric current is switched on and the crane then lifts the magnet with its load held in a tenacious but invisible grip. Dropping a load is equally simple. The magnet is swung into place, the current is cut off and the load is immediately deposited exactly where it is required. It is quite clear that, by the use of powerful magnets in connection with cranes for lifting purposes, both time and money are saved to a considerable extent, and also the workmen are spared labour of a particularly heavy nature.

Lifting-magnets are also very largely employed in various operations connected with the loading and unloading of ships. For instance, take the case of a vessel loaded with 1,800 tons of pig iron. With 28 men working, the time required to unload the vessel was two days and two nights, which corresponds to about 15 tons per man per day of 10 hours. When two lifting magnets were used, however, the ship was unloaded in 11 hours by two men whose duty consisted in operating the switches in the crane cabs. Thus two men and two magnets did the work of 28 men in about one-quarter of the time.

Types of Magnets and Their Work

The various tasks that magnets have to perform may be divided roughly into two classes—the very heavy work of handling billets, castings, pig iron and scrap, and the lighter task of dealing with plates, bars and tubes. The circular magnet shown on our cover is typical of powerful magnets specially designed for very heavy work. The working surface of this magnet is heavily ribbed on the underside, so that it will withstand rough use and at the same time provide better gripping power on the irregular shapes with which it has to deal. The illustration on this page shows a pair of rectangular magnets designed for lighter duty. In this case the working surfaces are flat in order to obtain a good grip on smooth surfaces. Rectangular magnets have the advantage that two or more may be mounted on a spreader-bar, as shown in the illustration, in order to prevent thin sheets or long thin bars being torn away from the magnet by whipping action.

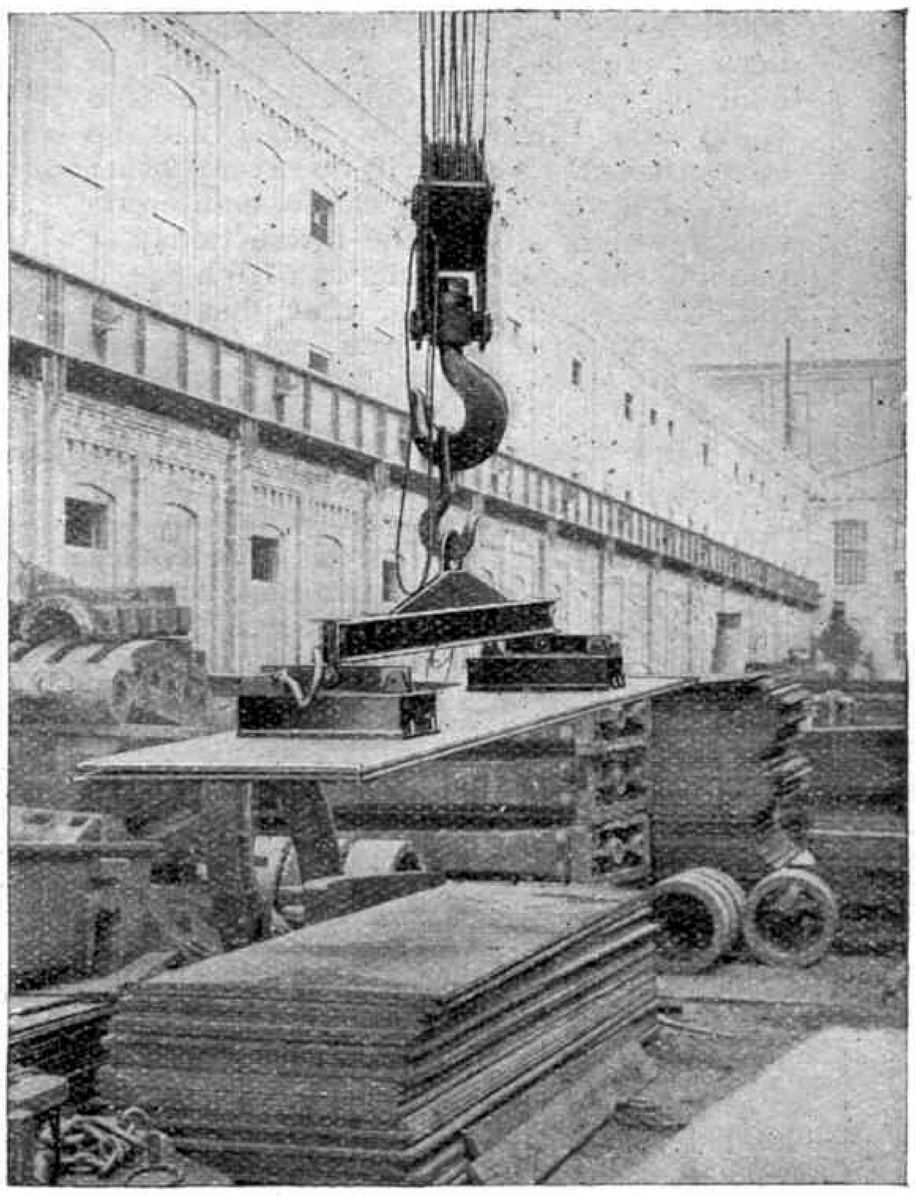


Photo courtesy of [*Messrs. Igranic Electric Co. Ltd.*

Lifting Ships' Plates with Electro-Magnets

For example, a ½" plate 10 or 15 ft. in length, attracted by a single magnet, would droop at both ends to such an extent that the plate would make contact with the magnetic pole along one line only, so that it would not be attracted with sufficient strength to ensure its being transported with safety.

Large lifting-magnets are frequently employed in the open air. They will work successfully under the severest weather conditions and actually may be used under water for salvaging magnetic material.

The amount that any particular magnet will lift depends not only upon the strength of the magnet but also upon the nature of the material it is lifting. For example, a magnet weighing 110 lb. will lift up to 4,000 lb. on a flat surface, but will not lift half this weight when handling pieces of pig iron or scrap material of rough and uneven shape.

Powerful Magnetic Pulleys

Another extremely important application of magnets in industry lies in the separation of iron and steel from other materials, an operation performed by what are called "magnetic separators." The iron may be extracted for its intrinsic value, or in order to prevent damage to crushing or grinding machinery, or to ensure the purity of food and other products.

In the case of materials that can be conveyed on a belt an effective device for removing stray iron is the magnetic pulley, which is a powerful electro-magnet made in the form of a pulley. The accompanying drawing shows clearly the principle on which magnetic pulleys work. The material from which the iron is to be separated passes along the conveyor belt and at the point of discharge the pulley, by means of its powerful magnetic attraction, draws the iron vigorously towards it. The belt interposed between the pulley and the material

automatically carries the iron out of the general direction of flow of the material, and on leaving the lower side of the pulley causes the iron to be discharged.

These pulleys are specially designed to obtain the greatest possible magnetic power, and some idea of their strength may be gained from the photograph published on page 357 of this issue. This shows a man suspended head downwards from a magnetic pulley. This man is held entirely by the attraction of the pulley for the nails in his boots!

Magnetic pulleys are employed in a number of industries. Many kinds of ore, for instance, are sent from the mines to be passed through crushing machines. These machines are very strongly constructed of the hardest metal, but if pieces of iron mixed with the ore find their way into the crushers, damage is always caused. Sometimes, indeed, the crusher is absolutely wrecked. To safeguard the crushers, therefore, magnetic pulleys are used to extract all iron before the material reaches the crushers. The iron that finds its way into the ore may include pick or hammer heads, tools, nuts, bolts or nails, and any one of these articles might cause a breakdown if it reached the crusher.

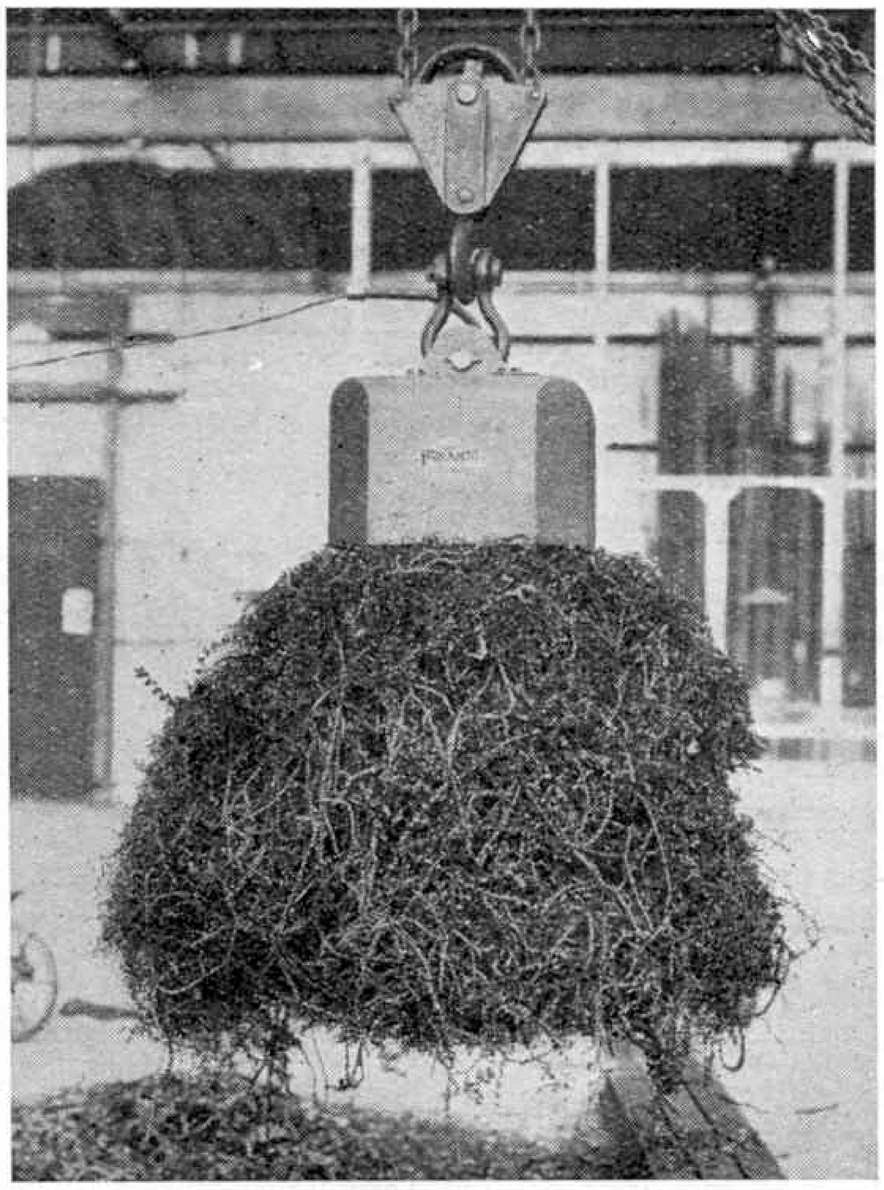


Photo courtesy] [*Messrs. Igranic Electric Co. Ltd.*

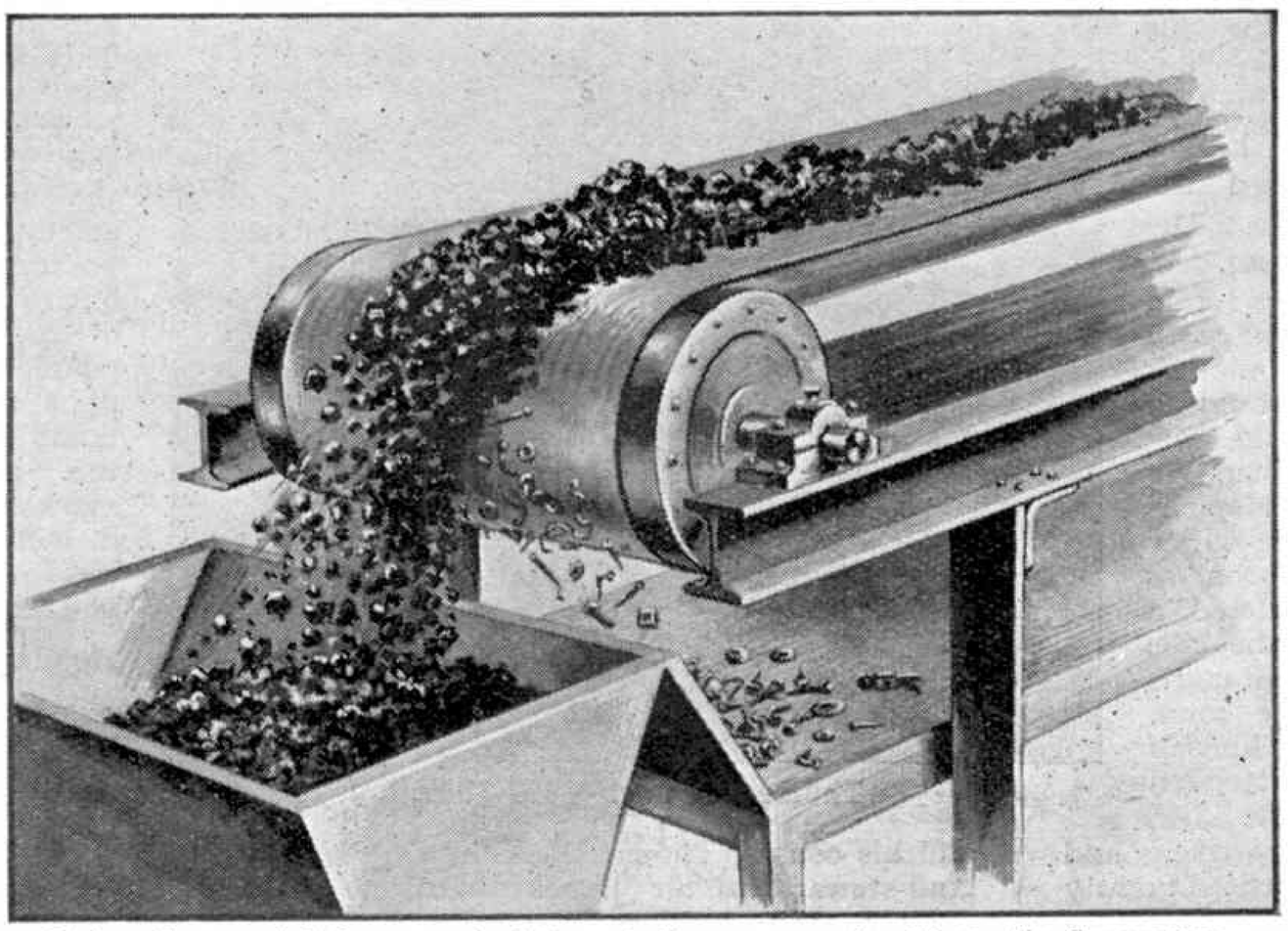
Electro-Magnet—Lifting Iron Turnings

Magnetic Separators at Destructors

Electro-magnetic separators play an important part in municipal salvage works and destructors. At the recently-opened Brookdale Road Salvage Works at Birmingham, where the plant is of the most up-to-date type, the household refuse is cleared of all magnetic material by means of specially-designed magnetic separators. The main objects of the process are to recover the tins, which have a commercial value, and to increase the value of the subsequent clinker by freeing it from iron.

In this case fixed electro-magnets are used. The refuse passes through a screen into a cylinder of brass revolving inside an electro-magnet of half-moon shape. The magnetic material is attracted against the inside of the brass cylinder and carried round and round until it passes beyond the electro-magnetic influence, and is discharged from a chute to one side. The remainder of the refuse passes straight on and falls on to conveyors of the band type, which carry it along to undergo further treatment.

Finally the refuse passes into the destructor furnaces, where it is burnt to clinker. After leaving the destructors the clinker is crushed, and then a final magnetic separation takes place to eliminate any magnetic material that may have been embedded in some combustible substance in the refuse and not taken out in the first separating process. The crushed clinker is fed on to the top of a revolving drum. The non-magnetic material drops into the main chute and is carried forward, but the magnetic material, as it comes under the influence of the electro-magnet, is attracted to the surface of the drum, carried round, and then released into a separate diverting chute.



Extracting metal from material on belt conveyor by Magnetic Separator.

The magnetic separation plant just described was designed and constructed by Messrs. The Rapid Magnetting Machine Co. Ltd., of Birmingham, to whom we are indebted for our information.

Eliminating Danger in Food

In flour mills, where there is a good deal of dust in the air, a spark produced by a fragment of iron getting into the grinding machinery may cause a serious explosion and fire. By passing the grain over magnetic separators, before it is ground, this danger is removed, and also flour absolutely free from iron is ensured. Magnetic separators are used also for extracting fragments of iron from prepared feed for cattle. In spite of the greatest care particles of iron are liable to find their way into the ingredients from which cattle-feed is made, and animals may be killed by swallowing these particles. The use of separators ensures that the prepared feed is free from all danger from this source.

Recovering Unburned Coal from Ashes

An interesting process has been devised for recovering coke and unburned coal from furnace ashes. Almost all kinds of coal contain a certain amount of iron, but this is in the form of iron pyrites, and is not magnetic. The process of combustion, however, changes this iron into iron oxides, which have magnetic properties. The ashes from the furnaces are passed over a revolving magnetic drum, and while the slag containing the iron is attracted to the surface of the drum and diverted, the coal and coke pass on, and in this way are recovered for use as fuel.

The principle of magnetic separation is made use of in many industries where we should scarcely expect to find it. In the making of china, for instance, separators are employed to remove any particles of iron that may be in the clay, because such particles would produce blue specks and tiny blisters in the ware—defects that may be seen occasionally in cheap ware of inferior quality. Other industries in which separators are utilised are glass-making and paper-making, the object in each case being to improve the quality of the finished product by removing all traces of iron.

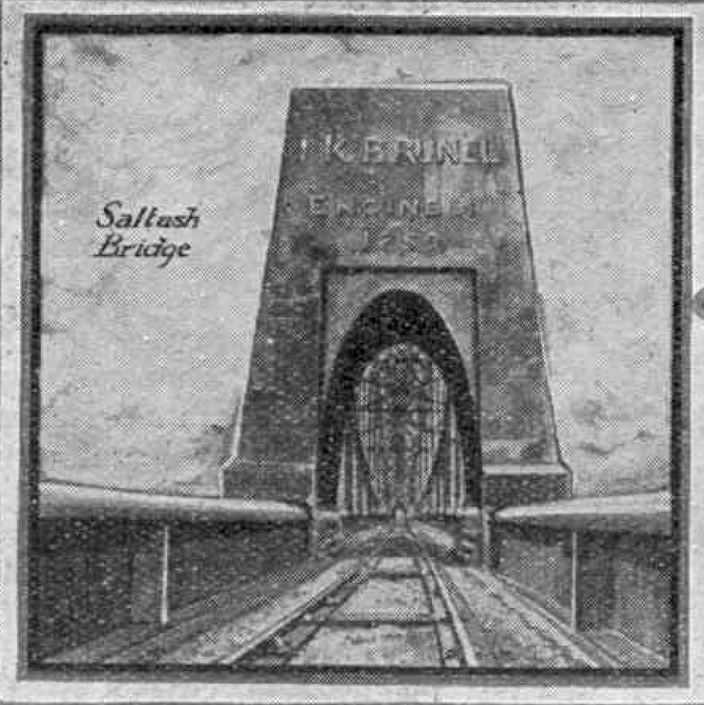
An Interesting Effect

Electro-magnets for all ordinary purposes are energised by continuous current. If an alternating current is sent through a coil of wire an alternating magnetic field is produced, and a core of iron placed inside the coil will undergo corresponding alternating magnetisation. Electro-magnets intended to be used with alternating currents have their iron cores laminated, that is built up in sections or strips instead of being solid, and fewer turns of wire are used in the coil than is the case where continuous current is to be employed.

A remarkable effect may be produced by means of an electro-magnet having a long laminated core of iron. If a ring made of aluminium is placed loosely over the core and an alternating current is sent through the coil, the ring is repelled and thrown up into the air, sometimes to a height of several feet. This repulsion is due to the fact that the currents induced in the aluminium ring are in opposite directions to those in the coil. If the ring is forcibly held down it very quickly becomes quite hot.

NEXT MONTH:—

Electric Bells, Indicators and Burglar Alarms



Lives of Famous Engineers

TELFORD
BRIDGES, ROADS AND CANALS
X

Telford's career is a striking example of great natural ability combined with unceasing industry. Beginning life as a working stone-mason, he became one of the greatest civil engineers of the day, but in spite of all his brilliant successes he was never satisfied with his work. He was always endeavouring to improve it still further, and his example is one that we can all follow.

THOMAS TELFORD was born on 9th August, 1757, in the parish of Westerkirk, which lies in a narrow part of the valley of the River Esk in the county of Dumfries, Scotland. His father was a shepherd on the farm of Glendinning, and the cottage in which he lived consisted simply of four mud walls covered by a thatched roof. It was as lonely a spot as could be imagined. At Glendinning the road ended, and beyond it stretched an unbroken solitude of moorland.

A Happy, Smiling Boy

Before Telford was four months old his father died, leaving his widow and child altogether unprovided for. The widow had a hard struggle to maintain herself and her boy, but she faced the task with undaunted courage. The warm-hearted farmers of the dale took pity on the fatherless child and by turns had him to live with them, and also gave his mother such employment as they could in the way of milking or hay-making. Telford grew up a happy, smiling lad, so full of fun and good spirits that he became known in the valley as "Laughing Tam." As soon as he was old enough he assisted a relative to attend sheep on the hills in the summer, and in winter he helped the farmers with the cows, ran errands and made himself generally useful. Later he attended a parish school at Westerkirk, where he learned reading, writing and some arithmetic, and also benefited greatly by the intercourse with the sons of neighbouring farmers and land-proprietors.

Presently the time came for the lad to be put to some regular calling, and at the age of fifteen he was apprenticed to a stone mason at Lochmaben, a small town a few miles away across the hills. This proved an unfortunate beginning, for his master treated him so badly that he ran away and returned to his mother, greatly to her consternation.

Attracted by Books

Telford was willing to go anywhere except back to his Lochmaben master,

Thomas Telford (1757-1834)

and his cousin, Thomas Jackson, who was land-steward to Sir James Johnstone of Wester Hall, induced a mason at the neighbouring town of Langholm to take the boy for the remainder of his apprenticeship.

This venture proved a great success and Telford completed his apprenticeship very happily. About this time the Duke of Buccleuch, the principal land-owner of the district, introduced many improvements on his estates, and this produced a demand for masons' labour. Telford thus obtained a considerable amount of useful experience, not only in erecting walls and farm enclosures, but also in building bridges across various streams where prepared roads were substituted for the existing cart tracks.

At this time Telford was rapidly developing a great love for reading that lasted throughout his life. He quickly exhausted the slender book resources of his friends and there appeared to be little opportunity for enlarging the scope of his reading. By good fortune, however, an elderly lady named Miss Pasley, who lived in the little town, took a fancy to the smiling, rosy-cheeked apprentice, invited him to her house and placed her little library at his disposal. This was a great day for the lad, and through this kindly act he became acquainted with much of the finest British literature. At the same time he made regular attempts at composition, including poetry, and by the time he was out of his apprenticeship, at the age of 22, he had become so good a penman that he was often called upon to write letters for his neighbours to their distant friends. In this respect Telford provided a marked contrast to Brindley, who, it will be remembered, was to the end of his days a shocking writer and an even worse speller!

Holding-up a Bridge

An amusing incident occurred during Telford's life at Langholm. His master and he had been employed upon a bridge across the Esk. Soon after this was finished a great flood came roaring down the valley and everybody thought the bridge would be carried away. The master-mason happened to be away at the time and his wife "Tibby," knowing that he was bound by contract to maintain the bridge for seven years, was in a state of great alarm. Telford did his best to reassure her, but it was no good, for she insisted that the bridge was shaking and was doomed. Presently she declared that she heard the bridge rumbling and set her back against the parapet as if

to hold it up. The absurdity of this action tickled Telford immensely, and the sight of him standing there shaking from head to foot with laughter at length convinced Tibby that there was no danger.

Having learned all that his native valley could teach him in the art of masonry, Telford went to Edinburgh, where extensive building operations were then in progress. He found abundant employment and he remained there for two years, during which he had the opportunity of taking part in first-class work and also of studying the ancient architecture in the neighbourhood. He then determined to go to London, and returned to his birth-place to take leave of his mother and his old friends.

Telford Goes to London

A piece of good fortune enabled him to make the journey to London on horseback instead of having to walk. Sir James Johnstone, of Wester Hall, wished to send a horse to a relative in London, but could not find anyone to take charge of it. Mr. Jackson, Sir James's steward—who, as we have already mentioned, was a cousin of Telford—suggested that Telford should ride the horse to London. The matter was quickly arranged, and in order to make the journey more comfortable, Mr. Jackson lent Telford his buckskin riding breeches. Telford reached London without any difficulty, and in after years Mr. Jackson used to tell with great glee the story of his cousin's ride, never forgetting to wind up with the words: "But Tam forgot to send me back my breeks!"

On his arrival in London, Telford duly delivered the horse and sought out Mr. J. Pasley, a prosperous merchant, to deliver to him a letter of introduction from his sister, Miss Pasley, who had befriended Telford in Langholm. Mr. Pasley gave Telford letters of introduction to Sir Wm. Chambers, the architect of Somerset House, which was then being erected. Sir William was in need of good workmen and he at once employed Telford. There was a great deal of fine masonry work to be done on this building, and Telford's ability and steady perseverance soon singled him out as being fitted for something better than the work of an ordinary mason.

About this time Telford was consulted by Mr. (afterwards Sir William) Pulteney in regard to certain alterations in the mansion of Wester Hall. Mr. Pulteney was the second son of Sir James Johnstone of Wester Hall, and took the name of Pulteney upon his marriage to Miss Pulteney, niece of the Earl of Bath, by whom he succeeded to a large fortune and extensive estates in the neighbourhood of Shrewsbury.

Work at Portsmouth

Telford's next move was to Portsmouth. How this came about is not clear, but at any rate in July 1784 he was engaged in superintending the erection of a house for the occupation of the Commissioner at Portsmouth Dockyard. Telford's letters written from Portsmouth showed that his work was greatly appreciated by the Commissioner.

His duties fully occupied the day, but at night he worked hard to increase his knowledge of everything connected with his trade. In one of his letters he wrote:—"I am not contented unless I can give a reason for every particular method or practice which is pursued. Hence I am now very deep in chemistry. The mode of making mortar in the best way led me to inquire into the nature of lime. Having, in pursuit of this inquiry, looked into some books on chemistry, I perceived the field was boundless; but that to assign satisfactory reasons for many mechanical processes required a general knowledge of that science. . . And I am determined to study the subject with unwearied attention until I attain some accurate knowledge of chemistry, which is of no less use in the practice of the arts than it is in that of medicine."

He adds rather quaintly that he has his hair powdered every day!

Telford's work at Portsmouth finished at the end of 1786, and shortly afterwards he was employed by Mr. Pulteney to superintend alterations necessary to fit up the castle on the latter's Shrewsbury estate as a place of residence. While engaged on this work Telford was fortunate enough to obtain the appointment—probably through the influence of Mr. Pulteney—of Surveyor of Public Works for the County of Salop. From this time Telford's labours became much wider in scope and he was occupied in surveying and repairing roads, bridges and gaols, and in supervising all the public buildings under the control of the magistrates of the county. Writing to a friend at Langholm at this time he says he is working very hard to improve himself in branches of knowledge in which he feels himself deficient, and he describes a notebook that he always carries, in which he crams all sorts of facts likely to be of use to him.

A Remarkable Incident

During Telford's term as surveyor, the church of St. Chad in Shrewsbury was in urgent need of repairs to the roof, which let in the rain. Telford was sent for by the churchwardens to advise them as to the best method of procedure. He accordingly examined the building, which was about 400 years old, and found it to be in such a dangerous condition that he refused to give any advice as to the repair of the roof until the churchwardens had decided to have the more essential parts of the structure made secure.

A vestry meeting was held and decided against Telford's ad-advice. As Telford wrote at the time to a friend, popular clamour overcame his report, and the vestry men refused to admit that there was any danger from the fractures in the walls, on the ground that these had been there from time immemorial! Telford ultimately left the meeting with the parting advice that if they wished to discuss further they had better adjourn to some other place where there was no danger of the roof falling on their heads.

This advice was received with jeers and ridicule, and the meeting called in a local mason and directed him to cut away the injured portion of the north-west pillar of the tower, which was the chief danger spot, in order to underbuild it. This work was commenced, and two days later in the early morning, while the workmen were waiting at the church door for the key, the great bell of the clock in the tower struck four. The vibration at once brought down the tower, which crashed on to the nave and shattered the whole structure. "The very parts I had pointed out," wrote Telford a few days after the disaster, "were those which gave way, and down tumbled the tower, forming a very remarkable ruin, which astounded and surprised the vestry and roused them from their infatuation, though they have not yet recovered from the shock!"

One of Telford's duties at this time was that of keeping the gaol prisoners at work. He had to think out schemes for employing them without risk of their escaping, and this gave him a great deal of anxiety. "Really," he wrote, "my felons are a very troublesome family!"

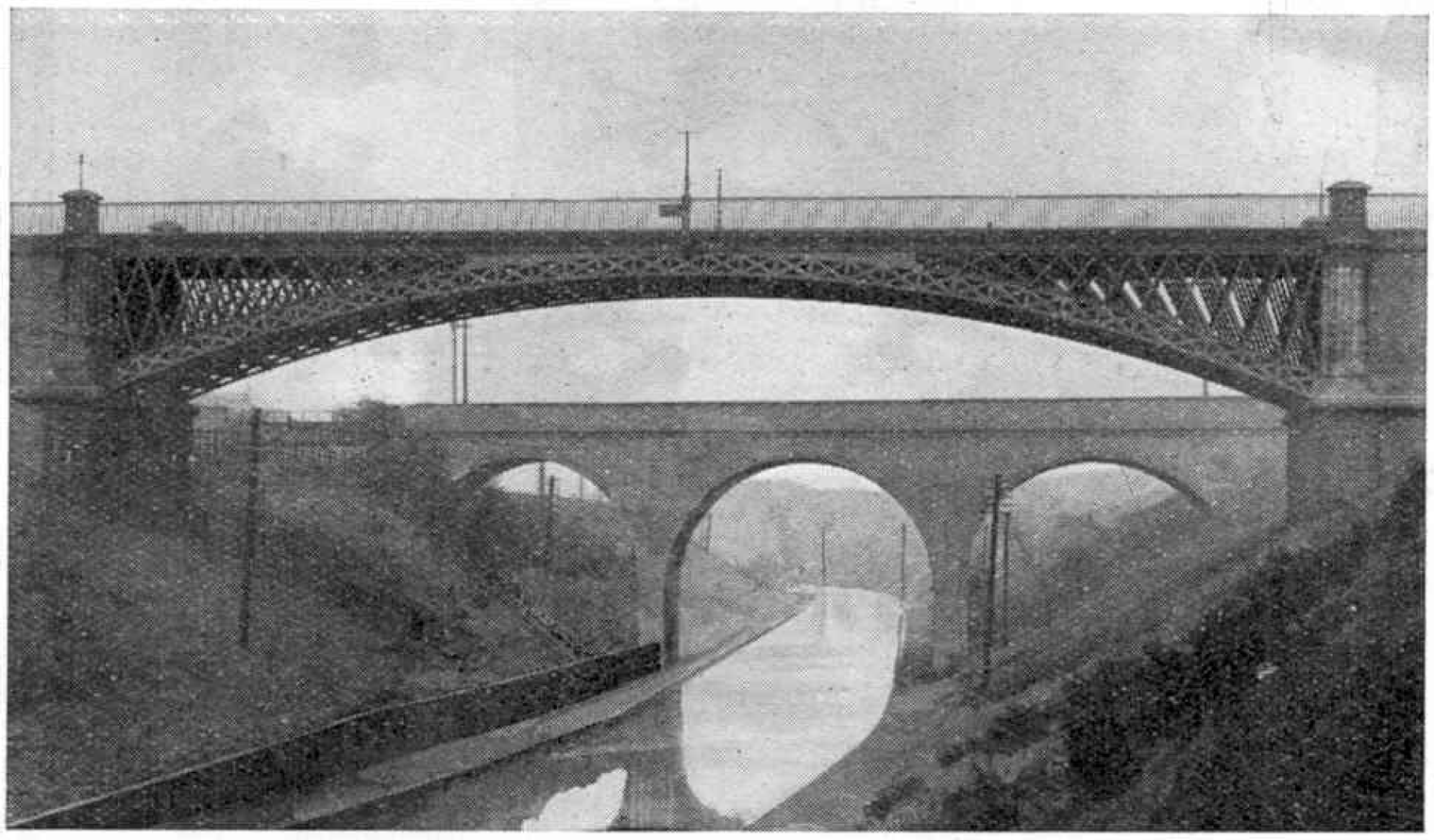


Photo courtesy] [*Messrs. The Horsley Bridge and Engineering Co. Ltd.*

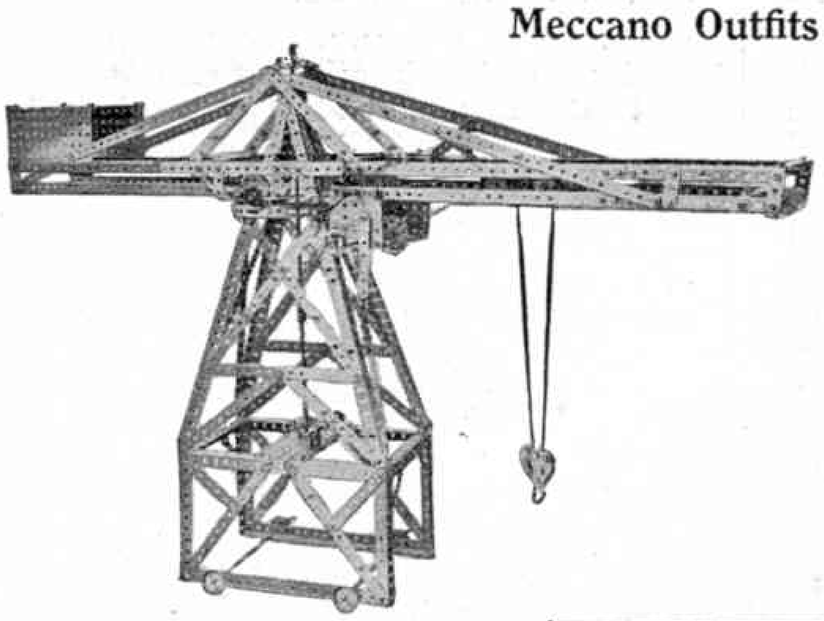
Telford's Iron Bridge at Smethwick

A Musical Experience

In our account of the life of James Brindley we described how his first and last visit to the theatre so upset him that he was incapable of doing any work for several days. Telford's experience was very different, and his first sight of Mrs. Jordan, the actress, at the Shrewsbury Theatre, appears to have worked him up to a pitch of rapturous delight. On the other hand he was utterly disappointed with a concert he heard about the same time. He could make nothing of the music. The only difference he recognised between one tune and another was that there was a difference of noise, and the

(*Continued on page* 344)

Meccano Outfits may be obtained from all leading toy stores



Radial Crane

This No. 2 Outfit costs 15/- *and builds* 163 *Models.*

Choose a Meccano Outfit for Christmas.

MECCANO

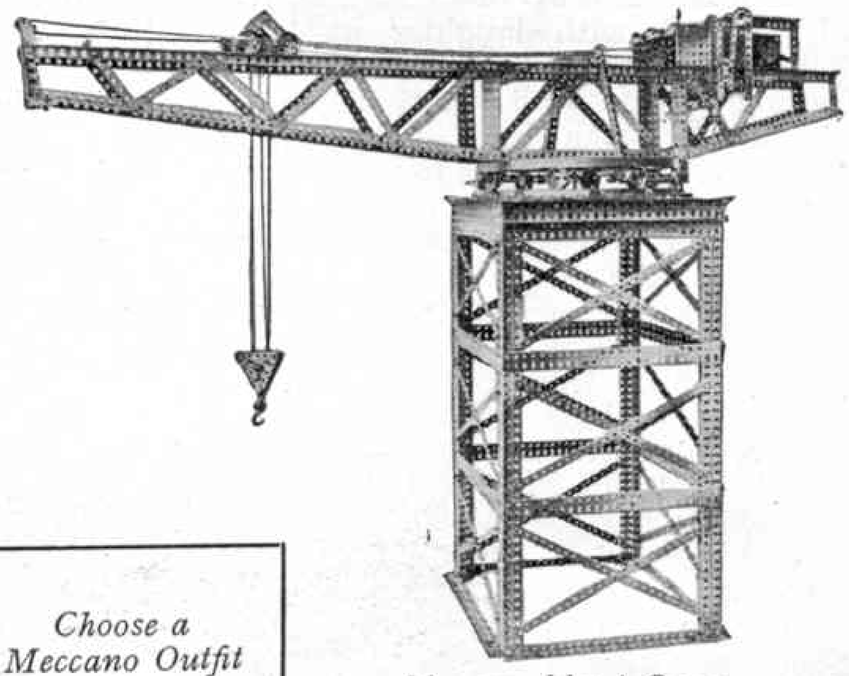
ENGINEERING FOR BOYS

You can build hundreds of working models with Meccano: Cranes of all types, Big Wheels, Motor Chassis, Lathes, Clocks, Looms that weave real fabric, and hundreds of others all equally interesting. No study is needed, you can commence building immediately you open your Outfit. The big illustrated Book of Instructions that goes with each Outfit makes everything easy.

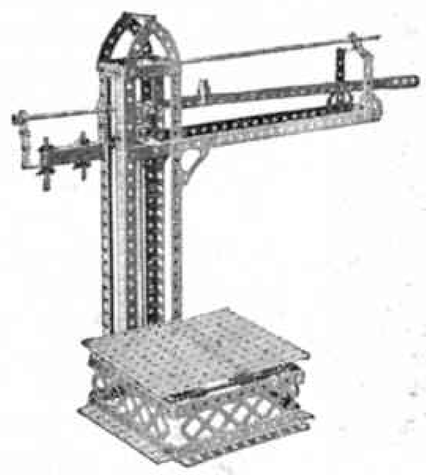
Meccano is sold in nine Outfits of varying sizes, numbered 00 to 7, and each Outfit may be converted into the one higher by adding the next Acccessory Outfit. Thus if a No. 2 Outfit is bought it may be converted into a No. 3 by purchasing a 2a; a No. 3a would then convert it into a No. 4, and so on up to No. 7.

COMPLETE OUTFITS	
No. 00	3/6
No. 0	5/-
No. 1	8/6
No. 2	15/-
No. 3	22/6
No. 4	40/-
No. 5 (in well-made carton) ...	55/-
No. 5 (in superior oak cabinet with lock and key)	85/-
No. 6 (in well-made carton) ...	105/-
No. 6 (in superior oak cabinet with lock and key)	140/-
No. 7 (in superior oak cabinet with lock and key)	370/-

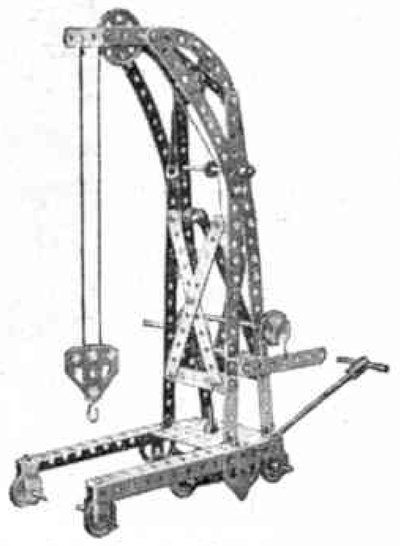
ACCESSORY OUTFITS	
No. 00a	1/6
No. 0a	4/-
No. 1a	7/6
No. 2a	8/6
No. 3a	18/6
No. 4a	15/-
No. 5a (in well-made carton)	50/-
No. 5a (in superior oak cabinet with lock and key)	80/-
No. 6a (in superior oak cabinet with lock and key)	210/-



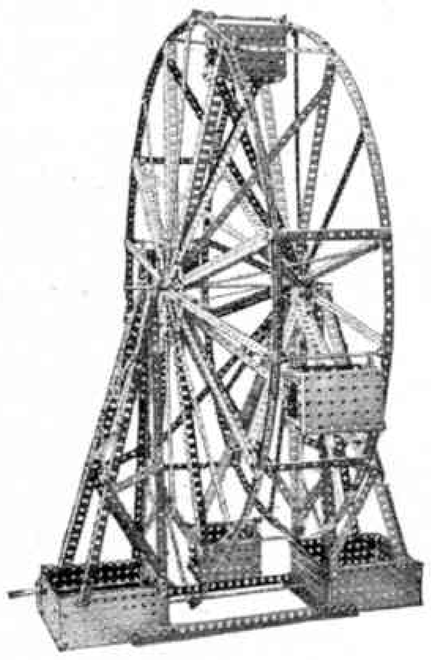
Hammer-Head Crane



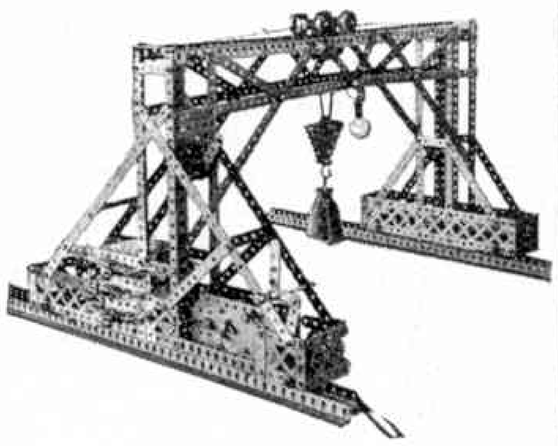
Platform Scales



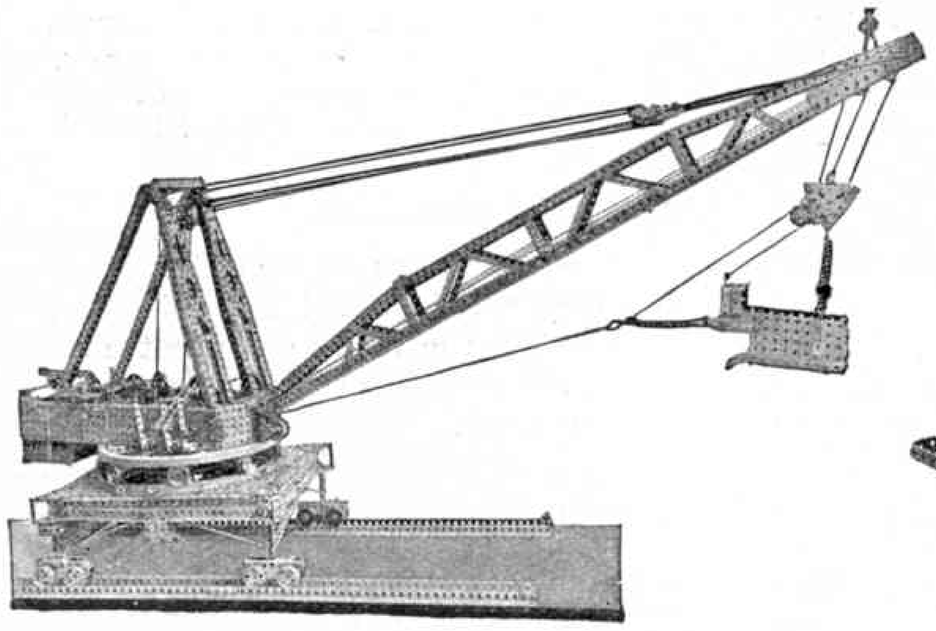
Platform Crane



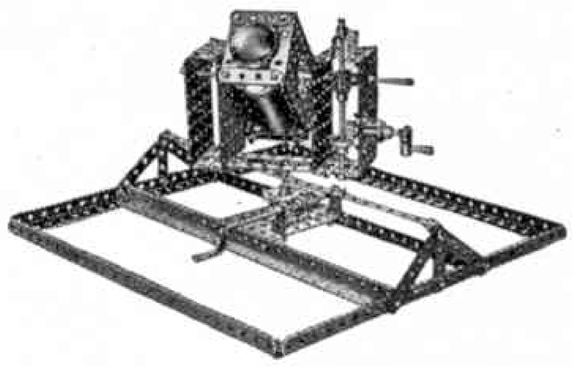
Big Wheel



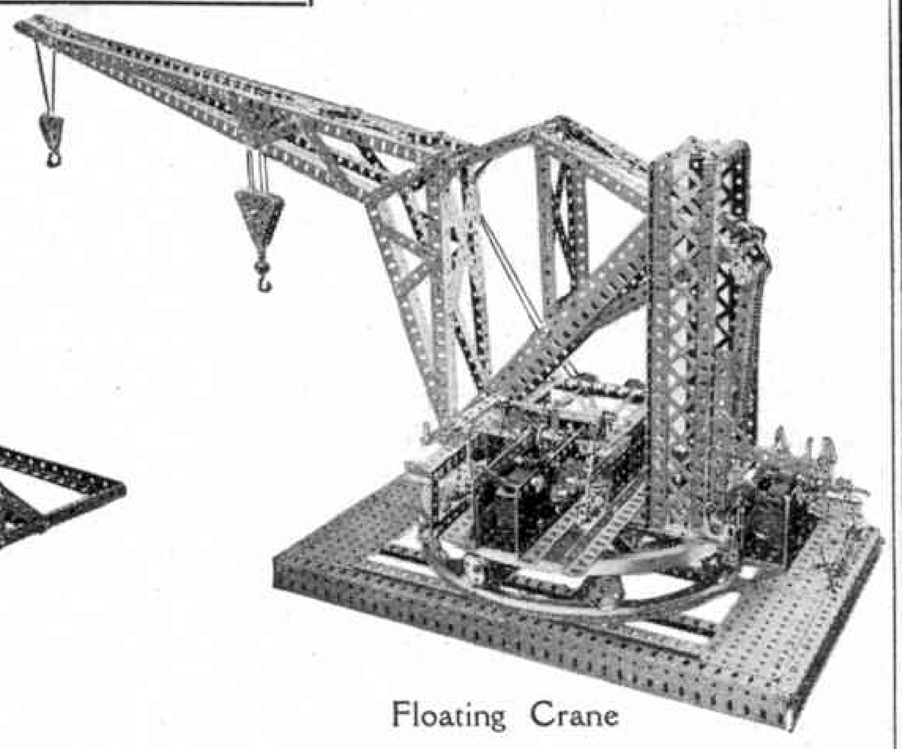
Gantry Crane



Dragline



Searchlight



Floating Crane

MECCANO LTD. BINNS ROAD LIVERPOOL

A NEW MECCANO MODEL

Model No. 717. Boat-Lowering Gear

ALTHOUGH models of a Boat-Lowering Gear are not entirely new to Meccano users, this model has recently been revised and very considerably improved, as will be seen from the illustration on page 329. Before describing how to construct the model, let us see something of boat-lowering arrangements in every-day use, for by studying actual practice we shall be better able to understand our model and to see exactly what principles are employed and what are the limitations in the method of construction and design.

Board of Trade Regulations for Ships

Travelling by sea to-day is safer than at any previous time. Not only are the great passenger ships built on the strongest possible lines, but also the provision for the safety of all on board in case of collision or other accident is marvellously complete, nothing being left to chance.

The latest Board of Trade regulations require that every foreign-going passenger steamship shall carry sufficient lifeboats to accommodate all on board. The regulations also require that the ship shall be equipped with the necessary appliances for getting these boats quickly and safely into the water.

Where the number of lifeboats is more than ten, one of them must be fitted with a wireless installation. Where there are more than fifteen boats, one must be a motor-boat fitted with wireless, and when the number exceeds twenty, two must be motor-boats so fitted. Motor-boats of this kind also must have searchlights. In addition each ship, according to her size, must carry a certain number of lifebuoys, and one life-jacket must be provided for each person on board.

The equipment for lifeboats is laid down in the regulations in great detail. Besides the necessary rowing and sailing tackle, each boat must carry sufficient fresh water to allow one quart for each person carried, and 2lb. of biscuits for each person. Oil for pouring on the water in rough weather and self-igniting red lights are also required to be carried. Each boat must be fully equipped before the ship leaves harbour, and the equipment must remain in the boats throughout the whole time the ship is at sea.

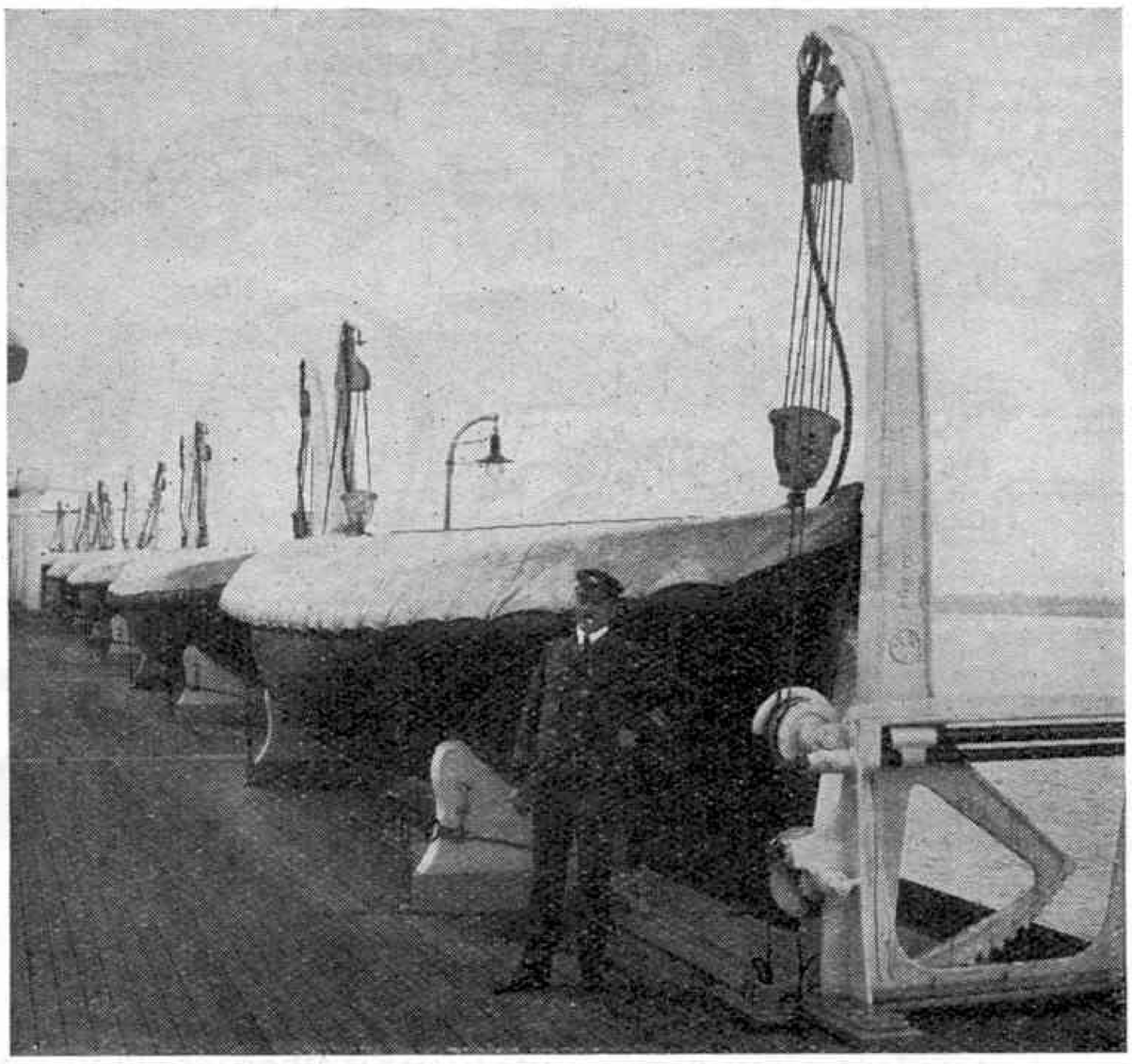
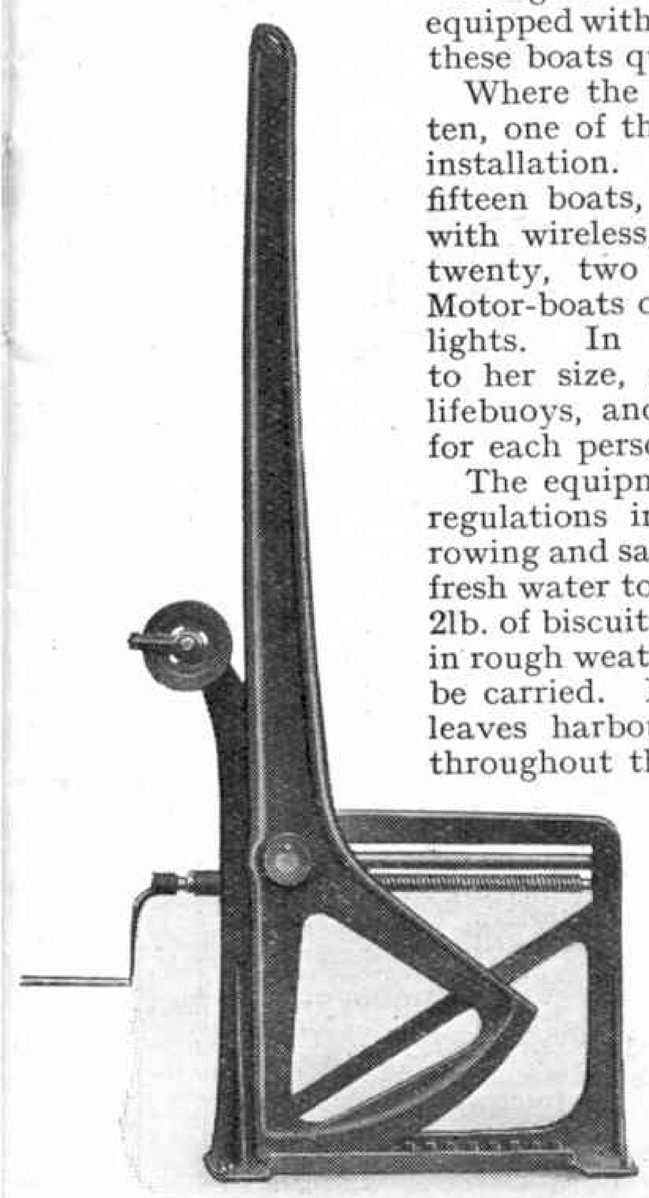


Photo courtesy of [*Messrs. Welin Davit & Engineering Co. Ltd.*

Fig. 1. The Boat Deck of R.M.S. "*Berengaria*" A Big Liner's Boat Deck



Photos courtesy of]

Fig. 2. Davit Arm—Inboard Position

Inspection Before Sailing

Before any passenger liner sails, her boat-lowering gear is inspected by a Board of Trade official to ensure that all the mechanism is in thoroughly efficient working order. At this inspection one or more boats selected by the official are actually lowered into the water, and the lifeboats generally are examined to see that they contain their stipulated equipment.

Boat-Lowering by Davits

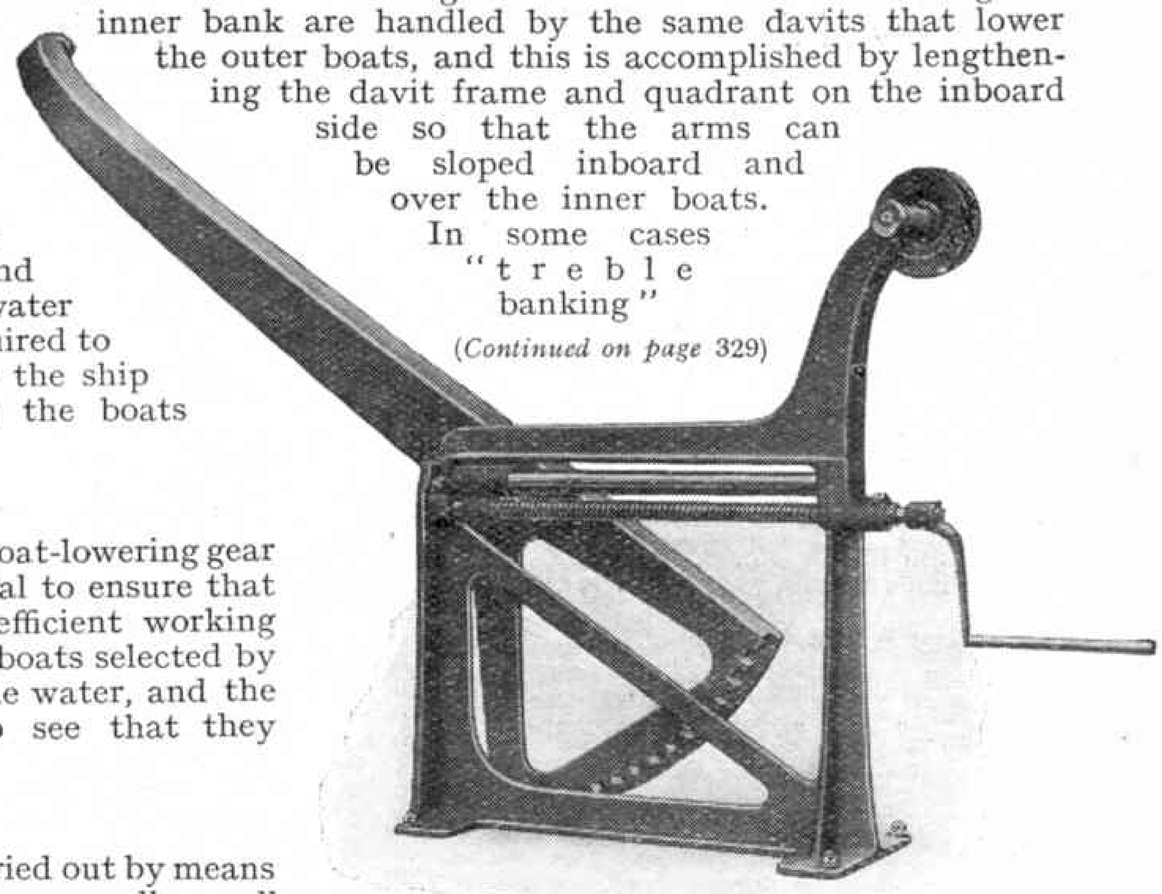
The lowering of ships' lifeboats is carried out by means of what are called "davits." Davits are really small cranes that can be rotated about their mountings so that a boat can be turned outboard and lowered, or lifted up from the water and turned inboard.

The majority of passenger liners are now fitted with the Welin davit, the principle of which is clearly shown in Figs. 2 and 3. The boat rests on chocks, the outboard portion of which falls flat on deck when released by means of a rod, fitted on the inboard portion and shown in Fig. 1. The arms of the davit, which carry the boat by rope and pulley falls, have quadrant-shaped bases with projecting teeth that engage in a rack bolted down to the deck of the ship. Each arm is pivoted on a sliding block which travels along a horizontal guide-bar close to the top of the frame, and is operated by a hand-controlled screw placed immediately below the guide-bar, Starting from the inboard position as in Fig. 2, the arms travel outboard to the position shown in Fig. 3, carrying the boat with them. At this point the boat hangs over the ship's side and is then lowered to the water.

Although the working principle of the davit is simple, the task of stowing away the large number of lifeboats carried by a big liner is somewhat complicated. The boats are usually housed on the top or boat deck of the vessel.

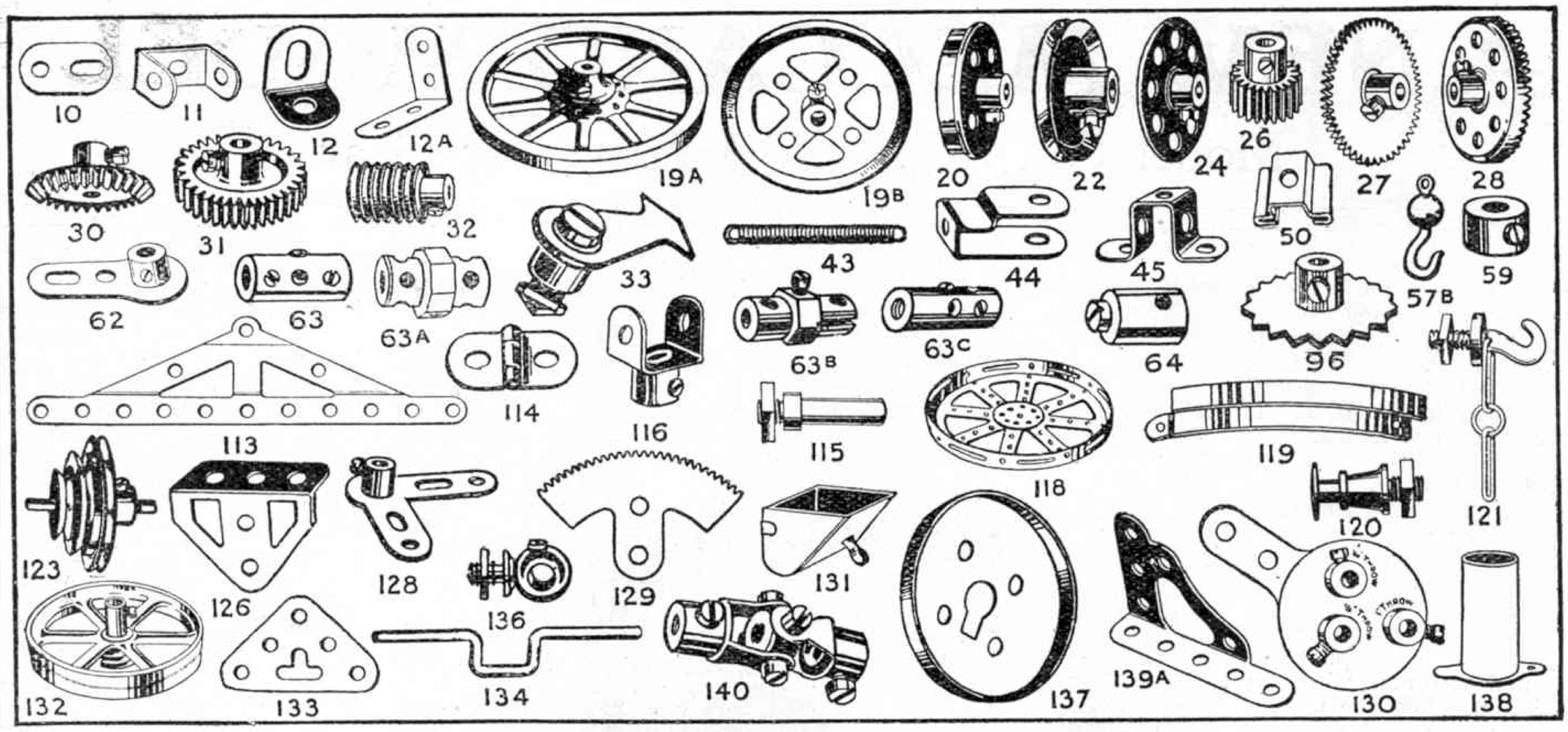
It is of the greatest importance that the amount of space occupied by the boats should be as limited as possible, consistent with perfect accessibility, and this problem is solved on the larger ships by a combination of interesting devices. Instead of "single banking," that is a single row of boats along each side of the boat deck, "double banking" is resorted to, so that there is a double line of boats along each side. The boats forming the inner bank are handled by the same davits that lower the outer boats, and this is accomplished by lengthening the davit frame and quadrant on the inboard side so that the arms can be sloped inboard and over the inner boats. In some cases "treble banking"

(*Continued on page* 329)



[*Messrs. Welin Davit and Engineering Co. Ltd.*

Fig. 3. Davit Arm—Outboard Position



MECCANO

ACCESSORY PARTS

We illustrate above a selection of accessory parts that every Meccano boy will find useful for building the larg r and more interesting models. Sometimes a model may be described in these pages that is beyond the capabilities of one of the smaller Outfi s, but by purchasing a few extra parts, it becomes possible to build the model.

Then again, where it is not desired to purchase an Accessory Outfit in the first instance, an Outfit may be gradually converted into a higher Outfit by purchasing the necessary parts, from time to time.

Many of these parts have only recently been introduced, and although we know that they have a universal use (were it otherwise they would not have been added to the system) we may not yet know *all* their applications. There are endless possibilities in the application of Meccano parts, and brainy boys endeavour to find new applications for them, and they make possible the invention of entirely new models, which gives more fun than merely copying the models in the Meccano Manuals.

If you have any difficulties in connection with using these parts, or any suggestions for new parts not already in the system, write to Meccano Ltd., Binns Road, Liverpool, and mark your envelope "Bright Ideas."

No.		s.	d.
10.	Flat Brackets ... ...½ doz.	0	2
11.	Double Brackets ... ... each	0	1
12.	Angle Brackets, ½″×½″ ... ... doz.	0	6
12A.	„ „ 1″×1″ ... ... each	0	1
12B.	„ „ 1″×½″ ... ... „	0	1
19A.	Wheels, 3″ diam. with set screws ... „	0	8
20.	Flanged Wheels ... ... „	0	6
	Pulley Wheels.		
19B.	3″ dia. with centre boss and set screw each	0	8
19C.	6″ „ „ „ „ „ „	2	6
20A.	2″ „ „ „ „ „ „	0	6
21.	1½″ „ „ „ „ „ „	0	6
23A.	½″ „ „ „ „ „ „	0	4
22A.	1″ „ without „ „ „ „	0	2
23.	½″ „ „ „ „ „ „	0	2
24.	Bush Wheels ... ... „	0	6
25.	Pinion Wheels, ¾″ diam. ... ... „	0	6
26.	„ „ ½″ „ ... ... „	0	4
27.	Gear Wheels, 50 teeth ... ... „	0	9
27A.	„ „ 57 „ ... ... „	0	9
28.	Contrate Wheels, 1½″ diam. ... ... „	0	9
29.	„ „ ¾″ „ ... ... „	0	6
30.	Bevel Gears ... ... „	0	10
31.	Gear Wheels, 1″, 38 teeth ... ... „	1	0
32.	Worm Wheels ... ... „	0	6
33.	Pawls (complete) ... ... „	0	4
33A.	Pivot Bolts with Nuts ... ... „	0	2
43.	Springs ... ... „	0	2

No.		s.	d.
44.	Cranked Bent Strips ... ... each	0	1
45.	Double Bent Strips... ... ... „	0	1
50.	Eye Pieces ... ... „	0	2
57.	Hooks ... ... „	0	1
57A.	„ (scientific) ... ... „	0	1
57B.	„ (loaded)... ... ... „	0	5
58.	Spring Cord ... ...per length	0	9
59.	Collars with Set Screws ... ... each	0	2
62.	Cranks ... ... „	0	3
62A.	Threaded Cranks ... ... „	0	4
63.	Couplings ... ... „	0	6
63A.	Octagonal Couplings ... ... „	0	8
63B.	Strip Couplings ... ... „	0	8
63C.	Threaded Couplings ... ... „	0	6
64.	Threaded Bosses ... ... „	0	2
65.	Centre Forks ... ... „	0	2
94.	Sprocket Chain ... ...per length	0	6
95.	Sprocket Wheels, 2″ diam. ... ... each	0	5
95A.	„ „ 1½″ „ ... ... „	0	4
95B.	„ „ 3″ „ ... ... „	0	6
96.	„ „ 1″ „ ... ... „	0	3
96A.	„ „ ¾″ „ ... ... „	0	3
109.	Face Plates, 2½″ diam. ... ... „	0	4
113.	Girder Frames ... ... „	0	2
114.	Hinges ... ... per pair	0	4
115.	Threaded Pins ... ... each	0	2
116.	Fork Pieces ... ... „	0	3
117.	Steel Balls, ⅜″ diam. ... ... doz.	0	6

No.		s.	d.
118.	Hub Discs (5½″ diam.) ... ... each	1	3
119.	Channel Segments (8 to circle, 11½″ diam.) ... ... „	0	4
120.	Buffers ... ... „	0	2
120A.	Spring Buffers ... ... per pair	0	8
121.	Train Couplings ... ... each	0	4
122.	Miniature Loaded Sacks ... ... „	0	2
123.	Cone Pulleys ... ... „	1	3
126.	Trunnions ... ... „	0	3
126A.	Flat Trunnions ... ... „	0	2
127.	Simple Bell Cranks ... ... „	0	3
128.	Boss Bell Cranks ... ... „	0	4
129.	Rack Segments, 3″ diam. ... ... „	0	6
130.	Triple Throw Eccentrics ... ... „	1	3
131.	Dredger Buckets ... ... „	0	2
132.	Flywheels, 2¾″ diam. ... ... „	2	3
133.	Corner Brackets ... ... „	0	3
134.	Crank Shafts, 1″ stroke ... ... „	0	3
136.	Handrail Supports ... ... „	0	3
137.	Wheel Flanges ... ... „	0	4
138.	Ship's Funnels ... ... „	0	4
139.	Flanged Brackets, right ... ... „	0	2
139A.	„ „ left ... ... „	0	2
140.	Universal Couplings ... ... „	0	9
141.	Wire Lines (for suspending clock weights) ... ... „	0	9
142.	Rubber Rings ... ... „	0	4
143.	Circular Girders, 5½″ diam. ... ... „	1	0

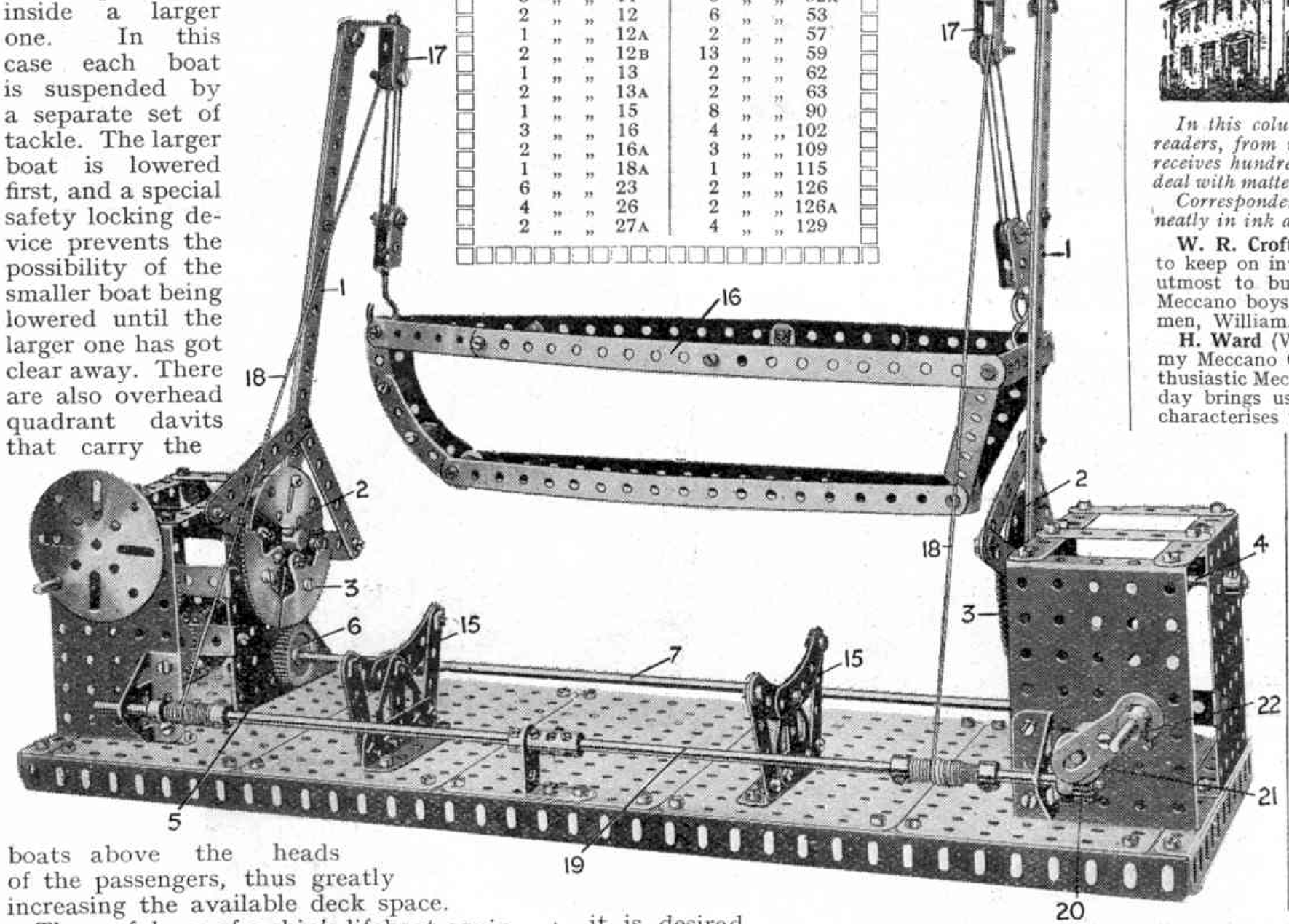
You may obtain these parts from your dealer, or direct from MECCANO LTD., BINNS ROAD, LIVERPOOL.

Boat-Lowering Gear—

(*Continued from page 327*)

is employed. "Double tiering," that is a second line of boats suspended above the first, is also regularly used.

Still another space-saving method consists of "nesting," that is placing a smaller boat inside a larger one. In this case each boat is suspended by a separate set of tackle. The larger boat is lowered first, and a special safety locking device prevents the possibility of the smaller boat being lowered until the larger one has got clear away. There are also overhead quadrant davits that carry the boats above the heads of the passengers, thus greatly increasing the available deck space.



The usefulness of a ship's lifeboat equipment may be still further added to by the employment of traversing gear, by means of which boats may be quickly transported from one side of the ship to the other.

Constructing the Model

Having now seen something of "the why and the wherefore" of boat-launching gear in practice, we may proceed to construct the Meccano model, as follows:

The davit arms (1) are connected to Face Plates (2) to which are bolted two Rack Segments (3) forming the usual geared quadrants. The davit arms are then secured to Rods (4) journalled in the Face Plates (5), the Rack Segments (3) being engaged and driven by 1" Gear Wheels (6) on an Axle Rod (7).

This Rod (7) carries a Pinion (8, Fig. 6) driven by a Worm (9) and a Rod, to which is secured a 1½" Gear Wheel (10). This is driven by a ½" Pinion (11) on a Rod, to which is also secured a 1½" Gear Wheel (12). This is driven by a ½" Pinion (13) rotated by a hand wheel formed by a Face Plate (14).

Parts required:

10	of	No.	1A	2	of	No.	31
2	„	„	2A	2	„	„	32
6	„	„	3	4	„	„	33A
7	„	„	5	142	„	„	37
8	„	„	6	14	„	„	38
2	„	„	7A	1	„	„	40
2	„	„	9	5	„	„	48A
2	„	„	9D	2	„	„	48B
3	„	„	11	5	„	„	52A
2	„	„	12	6	„	„	53
1	„	„	12A	2	„	„	57
2	„	„	12B	13	„	„	59
1	„	„	13	2	„	„	62
2	„	„	13A	2	„	„	63
1	„	„	15	8	„	„	90
3	„	„	16	4	„	„	102
2	„	„	16A	3	„	„	109
1	„	„	18A	1	„	„	115
6	„	„	23	2	„	„	126
4	„	„	26	2	„	„	126A
2	„	„	27A	4	„	„	129

As the hand wheel is rotated the davit arms are moved outboard when launching the boat (16) or inboard when it is desired to deposit the boat on the chocks (15).

The boat (16) is raised or lowered from the blocks (17) by the ropes (18) which wind on to a Rod (19). On this Rod is secured a ½" Pinion (20) engaged by a Worm (21), which is rotated by the Crank Handle (22) formed of two Cranks bolted together. In this way the boat may be lowered over the ship's side.

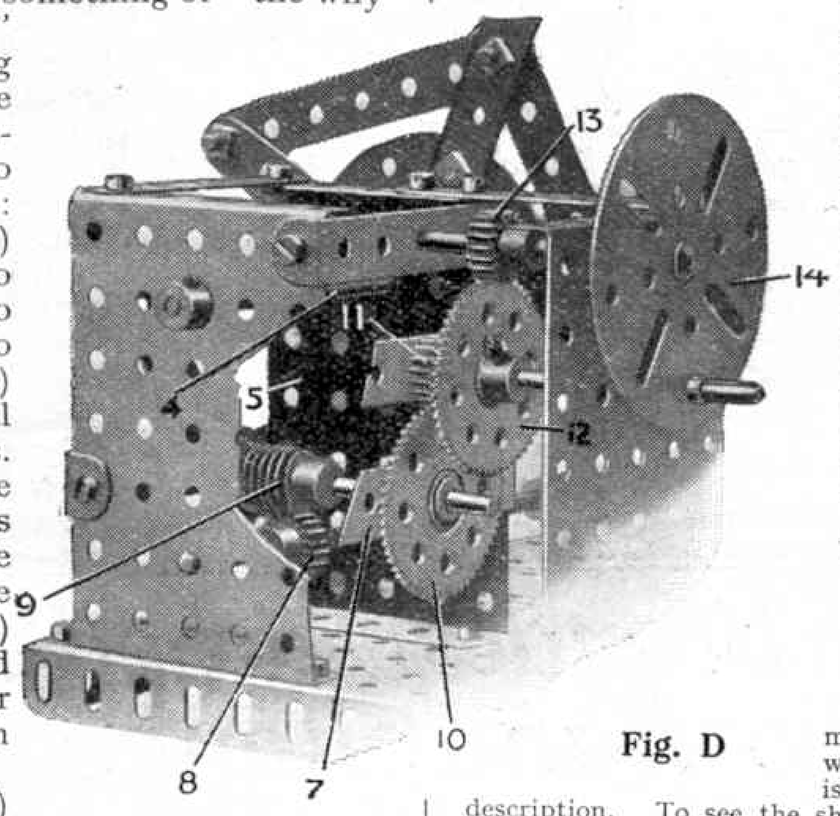


Fig. D

Next Month's "New Meccano Model"—**THE HIGH-SPEED SHIP-COALER.**

How to Build the MECCANO LOOM

The Meccano Loom demonstrates the process of weaving more perfectly than is possible by any written description. To see the shuttle flying from side to side and to see the reed and the picking-stick at work is a revelation, even to the Meccano boy accustomed to the marvels of model-building. With this Loom and a supply of "Silko" you may weave ties, hat-bands, and similar fabrics. These make splendid gifts for your friends, who will be amazed when they learn that the gift is your own handiwork and not the product of some large factory. Full instructions for building this wonderful model are now available in the form of an illustrated leaflet on art paper, price 4d. (post free).

OUR MAIL BAG

In this column the Editor replies to letters from his readers, from whom he is always pleased to hear. He receives hundreds of letters each day, but only those that deal with matters of general interest can be dealt with here.

Correspondents will help the Editor if they will write neatly in ink and on one side of the paper only.

W. R. Croft (Pontesbury).—"I seem to be forced to keep on inventing, thinking, and trying to do my utmost to build more new models." That is why Meccano boys grow up into brainy, useful, successful men, William.

H. Ward (Wigan).—"I live three miles away from my Meccano Club, but what are three miles to an enthusiastic Meccano boy?" Quite right, H. W. Every day brings us evidence of the wonderful spirit that characterises the dwellers in Meccanoland.

R. A. Gammans (Shoreham).—Nothing pleases us more than to receive thoughtful criticisms of the "*M.M.*" and suggestions for its improvement. You may be interested to hear that your proposal for the extension of the scope of our cycling article to include hints on motor-cycling has been made by several other readers. At present we have too many other important articles on hand to find room for such a feature, but it is quite possible that we shall be able to do so next year.

D. J. Kendrew (Southport).—Considering that you have been a reader of the "*M.M.*" for three years, we certainly think you should have written to us before, Donald! We hope you will atone for your neglect by writing regularly in future. As to short stories, we shall publish one or two occasionally, but many of our readers are of opinion that fiction is out of place in the "*M.M.*"

B. Pearson (Lye).—We hope you are well on the way to complete recovery now. The knee trouble from which you suffered is always difficult to get rid of, but with the care you are getting we feel sure you will eventually be quite all right again. Write us often.

W. S. Purves (Carlisle).—That's an extraordinary rabbit of yours, W. S. P., and we can understand your being so fond of such a clever animal. We think you are right in judging it to be a White Angora. We have no room just yet for a "How to Make" or a "Conjuring" page.

W. Harvey (Thornton).—No doubt you lost your medal at the time you fell off the 'bus, which made it a double calamity! However, as you were not damaged and as the police have restored your medal, all is well. We congratulate you on gaining a Scholarship. We find that many successes of this kind are won by Meccano boys.

D. Maclean (Chasetown).—We are glad you had such a fine time in London. We have seen all the sights you mention except Big Ben having his face washed, and that particular one has so far been denied to us!

N. F. J. Ward (Berkhampstead).—Thanks for photographs of the Bridgewater Monument, of which we had not heard before. What a fine view from the top! Your description makes everything clear.

A. V. King (767 Mess 46 London).—What magnificent experiences you have had during your tour round the Empire in H.M.S. "Hood." We are very glad to know that it was through the Meccano Guild and the "*M.M.*" that you formed a friendship with Mr. Sherwood and his son out in Canada. We appreciate all you say regarding us and our work amongst boys.

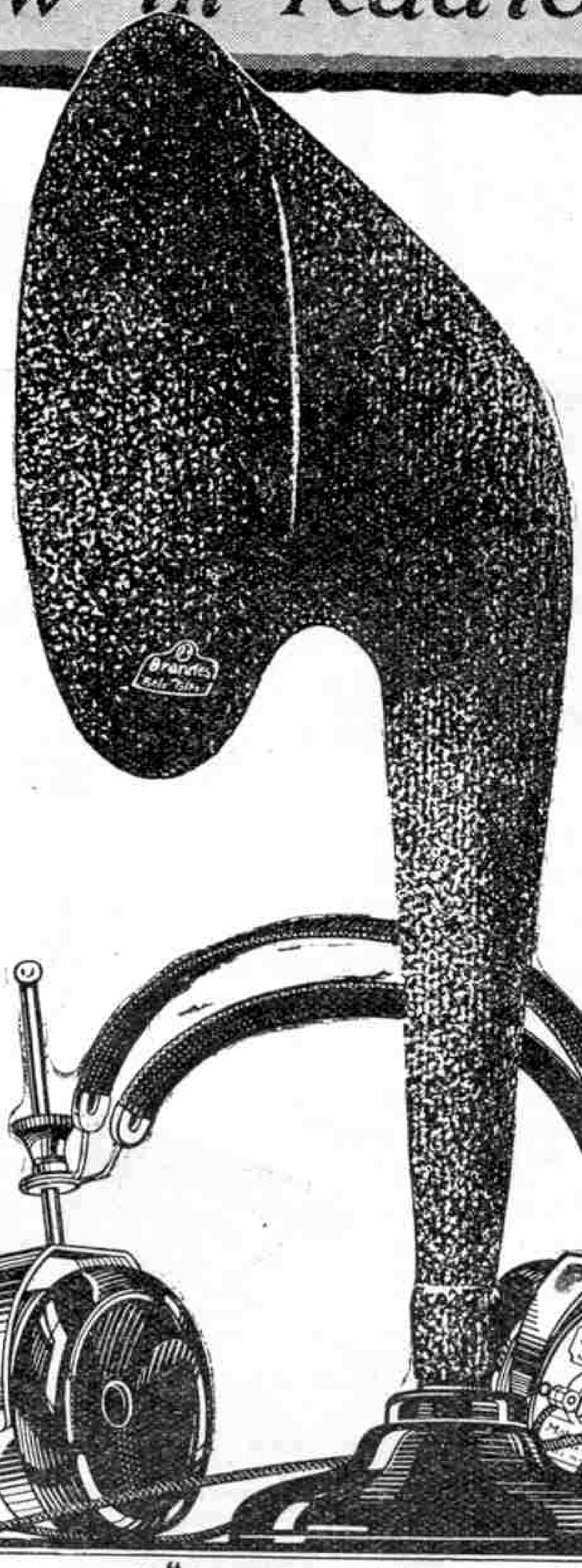
G. Corby (Cheadle).—We congratulate you on having won three prizes in our various Model-Building Competitions. We have a great variety of new Competitions this season and no doubt we shall resume the big Model-Building Contest later.

H. R. Dorsey (Leeds).—We also congratulate you on winning three prizes in succession in Model-Building Competitions. We wonder how many Meccano boys besides yourself and G. Corby have performed the hat trick!

B. Green (Enfield Wash).—We are glad to know that your thorough knowledge of Meccano has enabled you to secure a job with a first-class engineering firm. We are also very interested to hear that your Meccano Correspondence Club friend in Ceylon is coming over to see you, and we well understand your excitement at the prospect of meeting him.

Brandes

The Name to Know in Radio



Sweet bell-like notes

which gather intensity and beautifully balanced volume. Not a suspicion of dull tonelessness in the reception given by the "*Matched Tone*" Headphones. They are guarded from tone-deafness and distortion by the matched receivers. Both are carefully tested with special apparatus for sensitivity and volume so that they are as nearly identical as possible and you hear the same sound in both ears—which means everything. Now take the "*Table Talker.*" It has the same beautiful tone qualities. The horn is carefully matched to the unit to ensure a delightful uniformity of tone with sufficient volume to fill the largest room. Pleasantly simple lines and a neutral brown finish which blends harmoniously with any decorative scheme completes a tasteful and effective addition to your set.

All Brandes products are obtainable from any reputable Dealer and carry our official money-back guarantee enabling you to return them within 10 days if dissatisfied.

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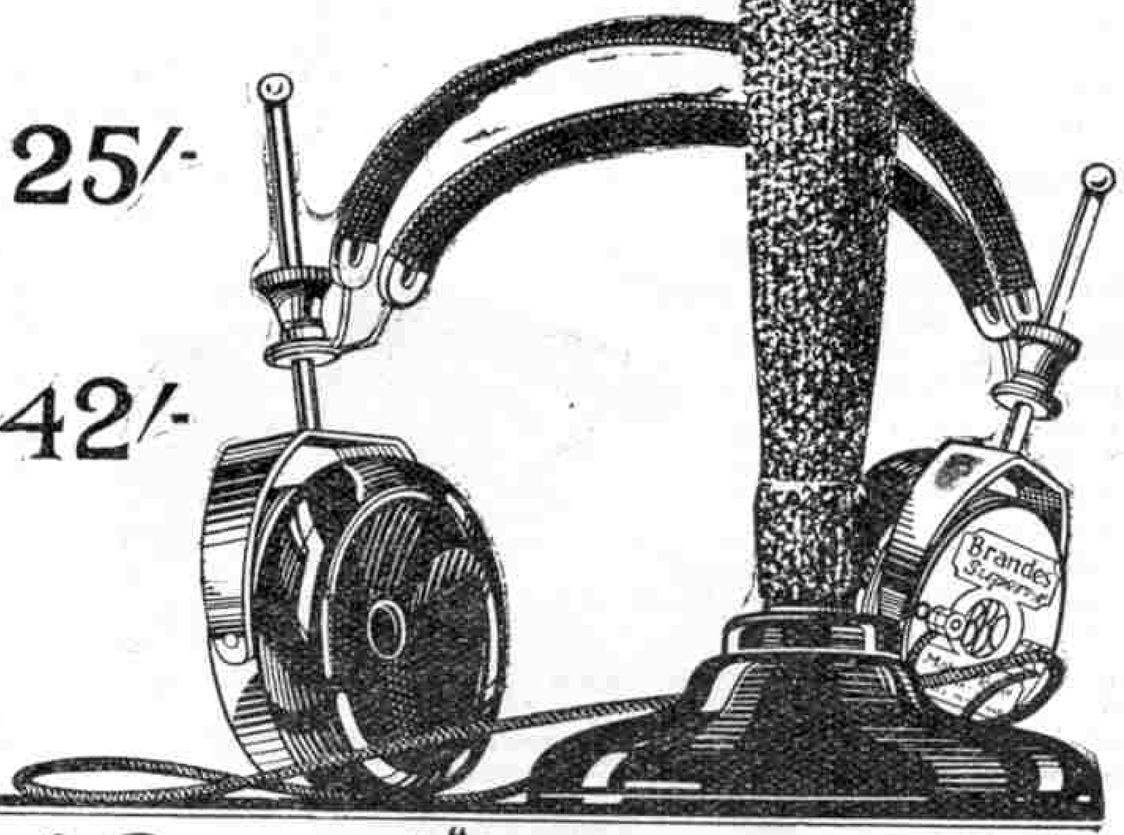
RADIO HEADPHONES 25/-

Table-Talker 42/-
TRADE MARK



Tune with Brandes "Matched Tone" Radio Headphones Then Listen with Brandes Table Talker

Brandes Limited, 296, Regent St., W.1. *WORKS: Slough, Bucks.*

Edouard Branly: Wireless Pioneer

Grants Special Interview to *"M.M."* Representative

IN an article in our June issue, describing how Marconi transmitted the first wireless signals across the Atlantic, we referred to the invention of the coherer by a Frenchman, Edouard Branly. Although the coherer is now a thing of the past, it played a great part in the early days of radio and it made possible the first successes of Marconi. Wireless communication has made such vast and rapid strides that to us to-day its beginnings seem very far off, and this makes it all the more interesting to know that Professor Branly, at the age of 80, is still in good health and working away at his beloved science in his laboratory in Paris.

A Valuable Discovery

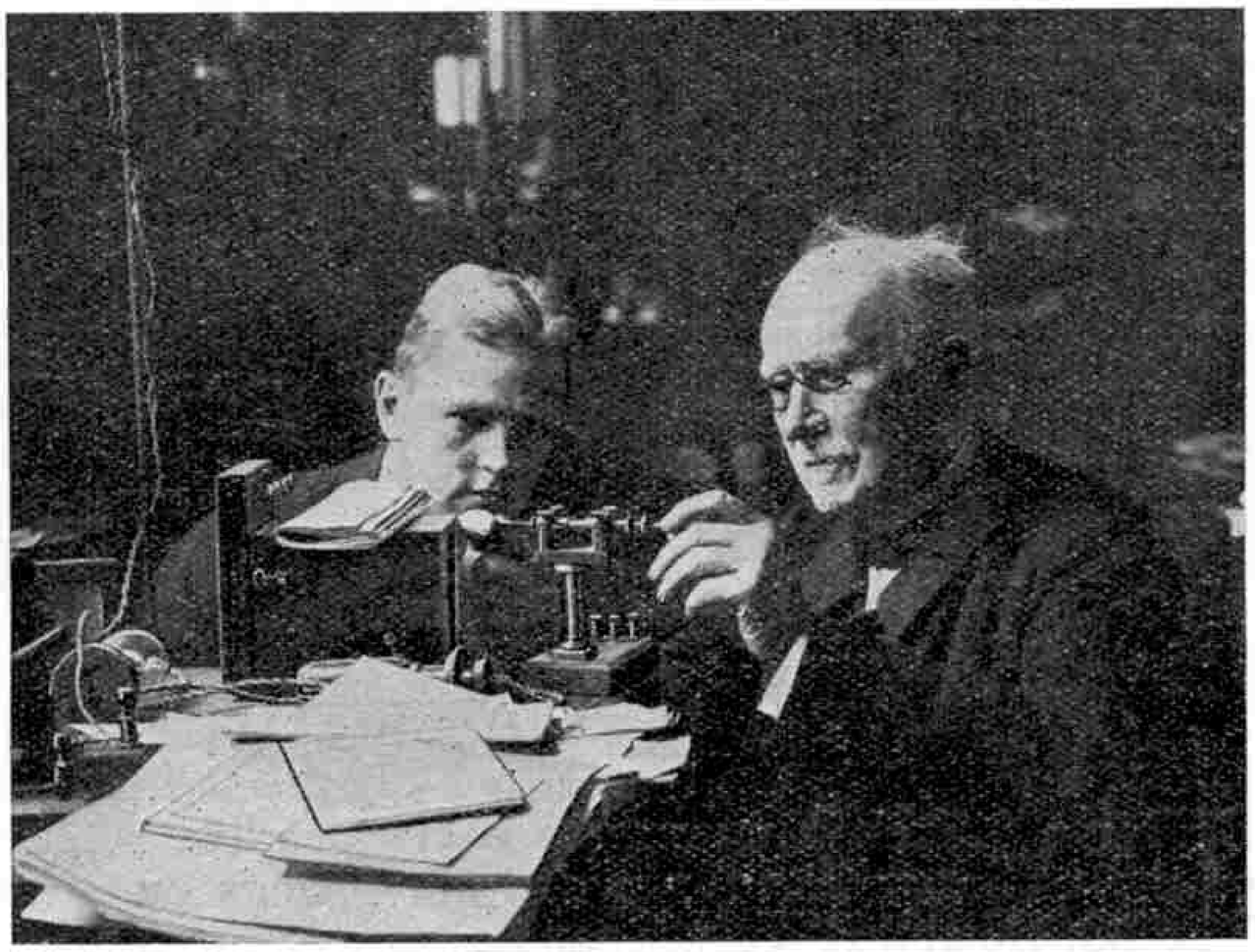
Professor Branly was born at Amiens on 23rd October, 1844. He studied first at the Lycée de Saint Quentin, and afterwards at the Lycée Normale Supérieure in Paris. He took the degree of Doctor of Science in 1873, and became Professor of Physics at the Université Catholique de Paris. From that time up to the present day, in spite of his arduous lecturing duties, he has never ceased to devote himself with the greatest enthusiasm to scientific research.

In our June issue we described the coherer—a little glass tube containing metal filings which, so long as they lie loosely, offer a very high resistance to the passage of an electric current, but which, when electric waves fall upon them, undergo some mysterious change so that their resistance is greatly lowered and a current can easily pass through them. The fact that a mass of loose-lying filings changed from a bad conductor to a good one when the discharge from a Leyden jar was passed through it was known as far back as 1835, but it was left for Branly to make practical use of this phenomenon. His invention of the coherer dates from 1890, but at first it attracted little attention, and it was not until Sir Oliver Lodge produced an improved form of the apparatus that the value of the invention was realised. Marconi improved the coherer still further and in his hands it became an important unit in the first practical form of wireless reception.

Branly Describes his Early Work

Knowing the keen interest taken by readers of the *"M.M."* in all great scientists and inventors, we asked our Paris representative to interview Professor Branly for us. Accordingly he called upon the veteran scientist a few weeks ago and received a characteristically warm welcome. We give our representative's account of his visit in his own words:—

"I found Professor Branly hard at work in his laboratory engaged in some important research. After he had greeted me he said: 'I have read your account of my work in the *Meccano Magazine*,* but you have got my age wrong. I was born in 1844, but I am not yet too old to work, and very soon I hope to finish my present research. In the meantime I cannot say anything about it.



M. Edouard Branly in his Laboratory in Paris

'As for my coherer, I suppose I did help the progress of radio-telegraphy. For years I studied the conductability of isolated bodies, and at last, in this very building, I made my first discovery. I hardly imagined at the time that similar results could be obtained at greater distances.

'In making my experiments I placed in the corner of the yard opposite my laboratory a spark coil, and in my laboratory a tube filled with soft iron filings, closed at both ends by two conductor stoppers communicating by means of a cell and a bell. Although the circuit was closed the bell did not ring, but as soon as the current entered the spark coil the bell rang continuously. The principle of wireless telegraphy was thus found, for it was possible to collect the waves transmitted by the spark coil without using a metallic conductor. I noticed that this conductability, once started, continued, and in order to make it cease I had to tap the tube slightly.

'Marconi profited by these experiments, and on achieving tangible results he sent me a testimonial of his admiration and thanks by a Marconigram sent from St. Margaret's, England, reading: 'Marconi sends Mr. Branly his respectful compliments across the Channel, this fine achievement being partly due to the remarkable researches of Mr. Branly.'"

A Message to "*M.M.*" Readers

"I asked Professor Branly about his researches.

'Oh,' he said, 'my difficulties have always been tremendous. I have never been well off and so have always lacked appliances. That forced me to study medicine and earn a living as a doctor. Of course it has helped me, and by making others well I know how to look after myself. I am never ill, and although I know monkey glands are good for some people, I do not think I will bother!'"

"How soon do you hope to finish your present work—in five years?"

"'Oh, less than that. After 80 one has had one's day—but when I succeed you can come and have another chat with me.'"

"Asked if he had any special message for Meccano boys, the Professor thought for a moment and then said: 'Tell them that nothing comes without hard work.'"

"Finally I asked Professor Branly if he still had a model of his first coherer. With a merry twinkle in his eye he replied: 'After thousands of experiments there is no first and no last, but here is a recent photograph of me which shows also one of my models.'"

* * * *

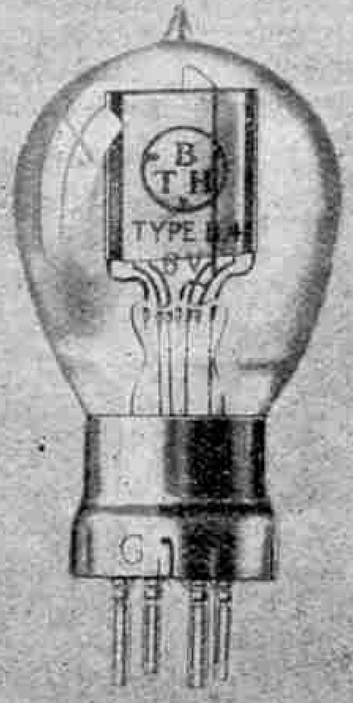
It is pleasant to know that the value of Professor Branly's scientific work has been recognised and that many honours have been awarded him. He was a prizeman of the Académie des Sciences in 1898, and at the Universal Exhibition of 1900 he was awarded a Grand Prix. Later he became a Chevalier of the Legion of Honour with the following mention in the official Gazette: "Has discovered the principle of wireless telegraphy." In 1910 the Society for the Encouragement of National Industry awarded him their "Argenteuil" prize, and since that year he has been an Associate Member of the Belgian Royal Academy. A further honour was bestowed upon him last year when he received the order of Commander of the Legion of Honour.

We feel sure that our readers will join us in sending our best wishes to this eminent French scientist, and we one and all hope he may long be spared to continue those great researches that lie nearest to his heart.

* Professor Branly refers to the articles "The Men Who Gave us Radio" that appeared in our March 1923 to December 1923 issues inclusive.

B.T.H.
RADIO VALVES

B3.



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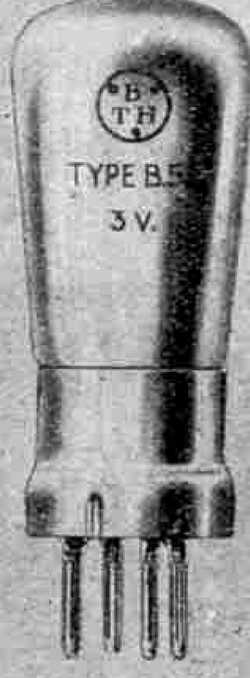

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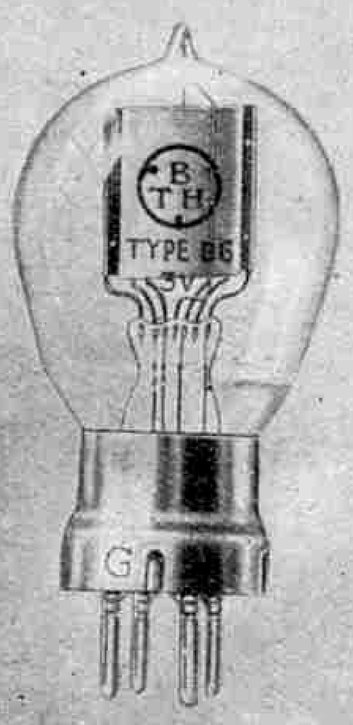

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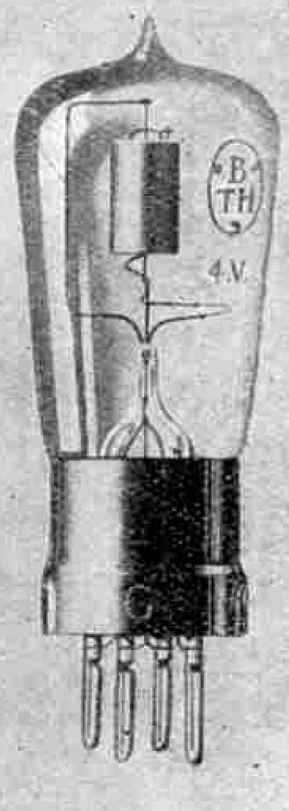

R.

THESE five B.T.H. Valves meet every possible requirement of the ordinary listener-in and the serious experimenter.

The B3, B5 and R Valves can be used in any position, for detection or high or low frequency amplification, while the B4 and B6 Valves are intended primarily for low frequency power amplification.

Be sure your next valve is a B.T.H. Valve. Look for the initials "B.T.H." which are the sign of high quality, and for the silvered bulb which denotes a perfect vacuum.

Obtainable from all Electricians & Radio Dealers.

We also make Crystal Sets, Valve-Crystal Sets, Valve Sets, Headphones, Loud Speakers, Amplifiers and "Tungar" Battery chargers.

B3 Valve.....Price 21/-
Filament Volts.....2 volts.
Filament Current...0.35 amps.
Anode Volts.....20-80 volts.
B4 Valve.....Price 35/-
Filament Volts.....6 volts.
Filament Current...0.25 amps.
Anode Volts.....40-100 volts.
B5 Valve.....Price 25/-
Filament Volts.....3 volts.
Filament Current...0.06 amps.
Anode Volts.....20-80 volts.
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Filament Current...0.12 amps.
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Filament Volts.....4 volts.
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2219

How Wireless Valves are Made

An Industry of Marvellous Exactitude and Efficiency

IN our last two instalments of this article we have dealt with the making of the grid itself, the making of the electrodes and the sealing and evacuating of the bulb. We are now to learn how the valves are finished and tested before they are packed and sent away to the retailer for sale.

When the bulbs have been exhausted and fitted with a nickel-plated shell, the standard four-pin plug is fitted to the base, and the copper wires from the electrodes are threaded through the holes in the disc beside the pins, to which they are finally secured by solder.

Careful Testing

The shell is then pinched in three places, so that it fits into three grooves in the edge of the disc. These grooves prevent the disc from being twisted round inside the shell and so causing possible short circuits.

The valves are allowed to stand for a short time so that they will settle down, or "age" as it is called, before being tested. They are then carefully examined and passed to the test rooms.

In the first place, the total emission obtainable under specified conditions is measured, and must exceed a certain minimum value if the valve is to be passed. This test is followed by another that ensures that the valves are sufficiently silent in operation, and that they will function equally well as detectors and amplifiers. All tests are made with the most delicate instruments and the slightest defect in the performance of a valve causes it to be summarily rejected.

When the valves have passed all tests satisfactorily they are ready for cleaning, etching, and packing.

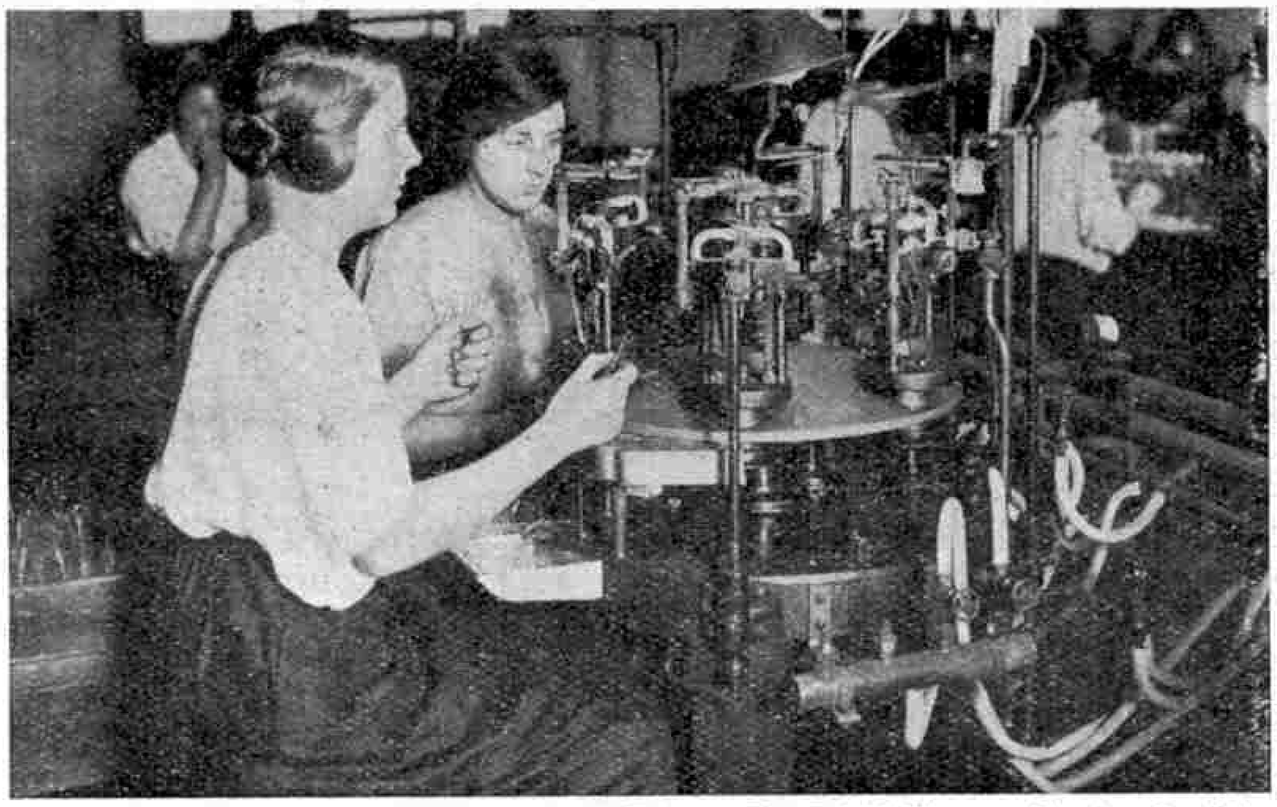


Photo courtesy of] [Messrs. The British Thomson-Houston Co. Ltd.

Making the Stems of Wireless Valves

A special rotating machine is used for this work, the operator feeding it with the necessary parts as it rotates.

Dull-Emitter Valves

During the past few months considerable attention has been devoted to a comparatively new type of valve, known as the "dull-emitter." The main advantages of this type are—(1) it has a much longer operating life, (2) the filament energy required to give the necessary emission is considerably less than that necessary with the ordinary type of valve and (3) it is generally much quieter in operation than the ordinary valve. These advantages are directly due to the lower temperature at which the valve operates.

The difference between a dull-emitter valve and a valve of the ordinary type is that the filament wire contains a small quantity of thorium, which is the factor that enables the necessary emission to be obtained at a comparatively low temperature.

A Layer One Atom Deep!

There is not a great deal of difference between the manufacture of dull-emitter valves and ordinary valves until after the exhausting and capping processes have been completed. As the wire used for dull-emitter filaments is more liable to loss of emission by contamination with certain gases than is the ordinary tungsten wire, great care must be taken that exhaustion takes place under the best possible conditions. Then the valves undergo a more complicated ageing process than is necessary for the ordinary valves, in order that the emission may be developed. The result of this ageing process is that a layer of thorium—supposed to be one atom deep—is formed on the surface of the filament.

When a dull-emitter valve is being used the thorium gradually evaporates from the surface of the filament. As long as the valve is not run above its normal voltage, however, the reactions taking place inside the filament are such that the rate of evaporation is equalled by the rate at which the thorium is produced.

Assuming that a dull-emitter valve is treated with ordinary care, its life will be terminated only by loss of emission. When this stage is arrived at, although the filament may remain intact, the valve will not function at the normal filament voltage, because no thorium remains.

At present, the information on the performance of dull-emitter valves is somewhat scanty, because they are a comparatively recent development. It is interesting to know, however, that some of the B.T.H. B5 valves have been burning continuously for 2,000 hours at normal filament voltage and with 40 volts on the anode. At the end of that time the thorium emission that remained has been sufficient for the continued working of the valves.

A "Tip" to Restore Efficiency

Occasionally, after a dull-emitter has been in use for a short time, the valve may cease to function. Usually this may be traced to a falling-off of the emission, caused by the filament having been operated

(*Continued on page 357*)

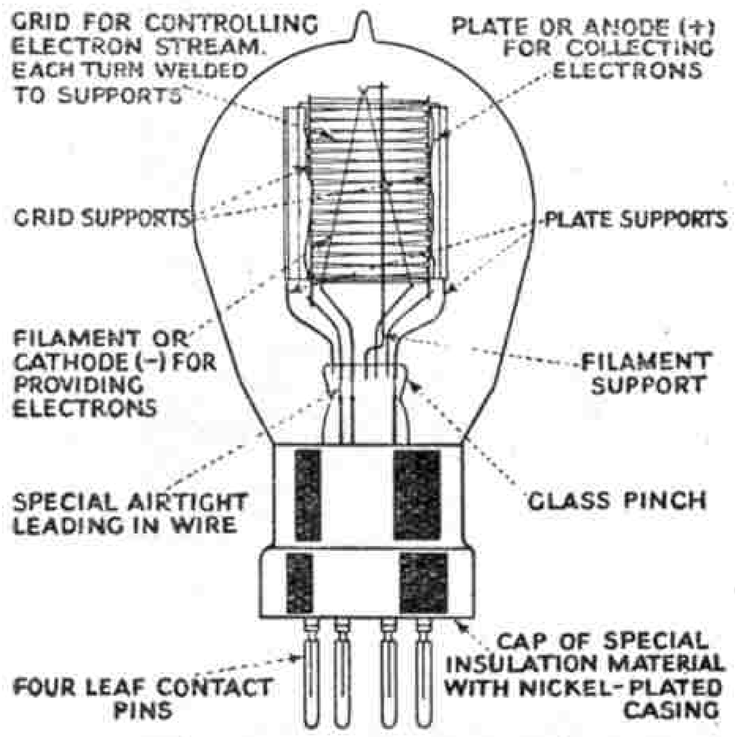


Diagram of B.T.H. Valve—Type B4

The filament of these valves normally operates at 6-volts and the anode at from 40–100 volts according to whether the valve is being used as a detector or as an amplifier.

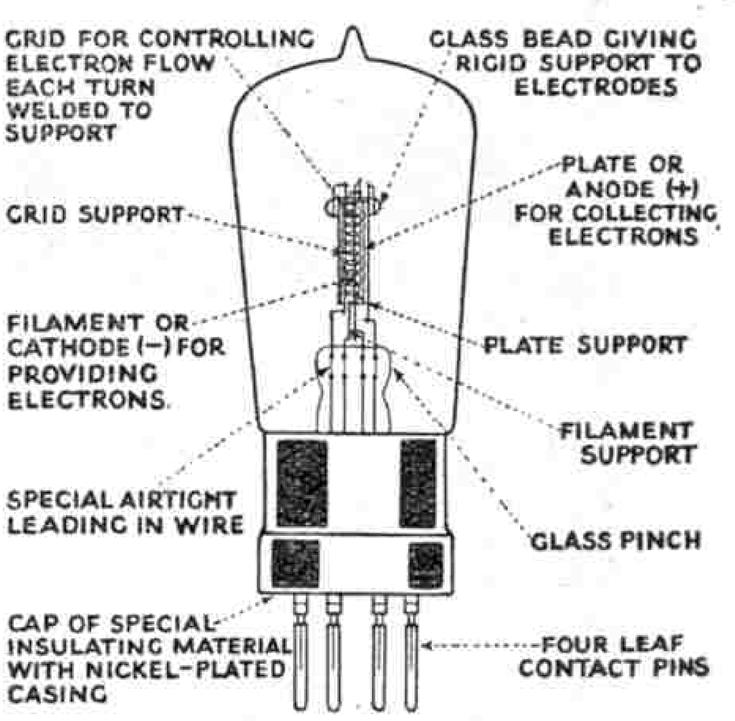
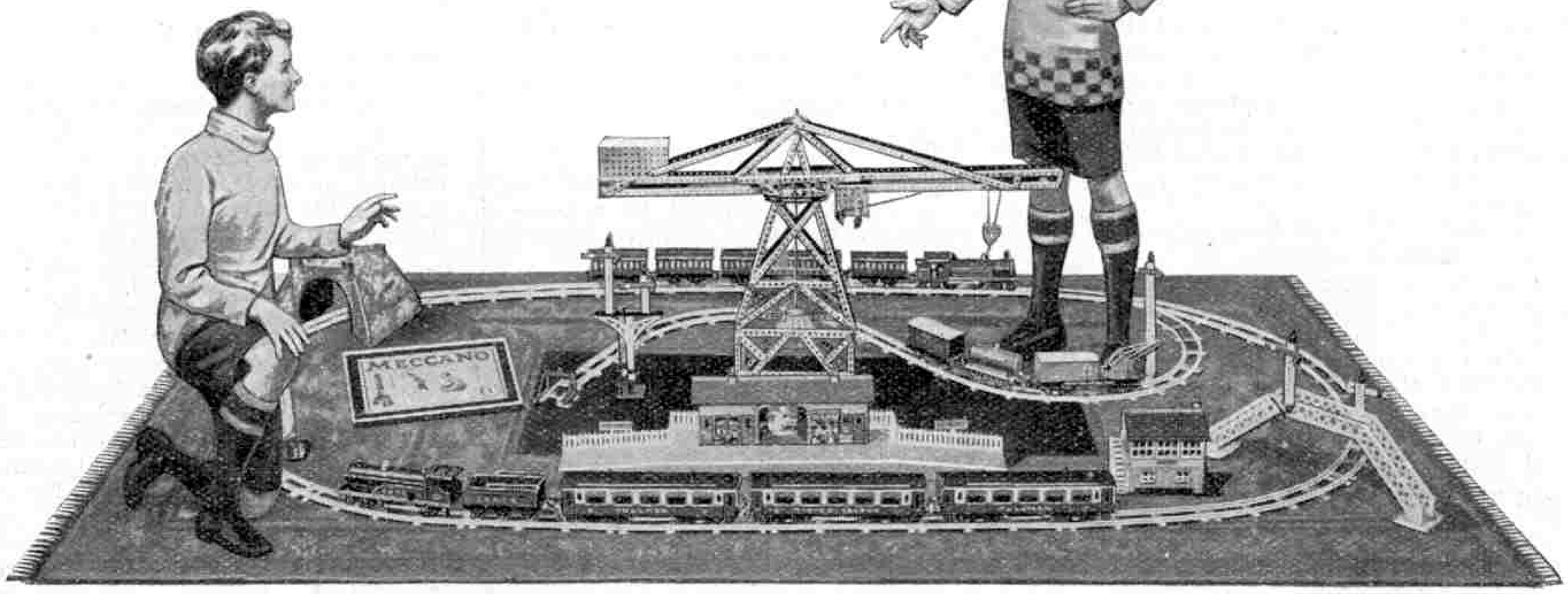


Diagram of B.T.H. Valve—Type B5

The filaments of these dull-emitter valves operate at 3 volts and take 0.06 ampere. The anode voltage should not exceed 40 volts. Good results may, however, be obtained with 20 volts.

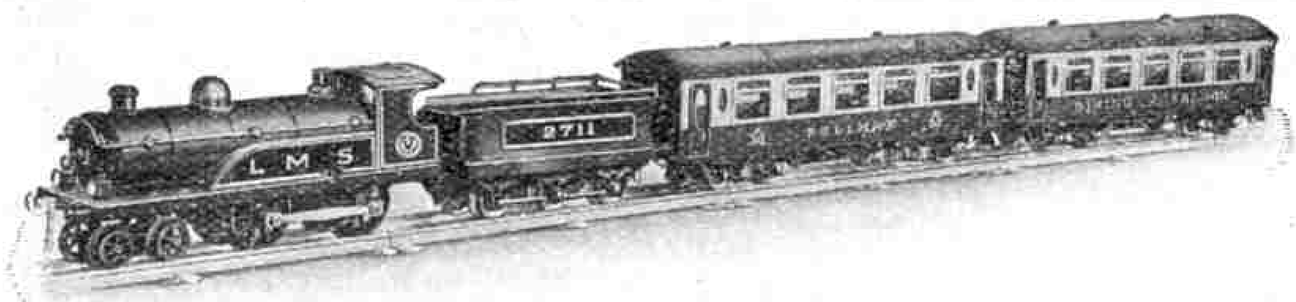
HORNBY CLOCK WORK TRAINS

THE TRAINS WITH THE GUARANTEE



YOU can have any amount of fun playing with a Hornby Train. Shunting, coupling-up the rolling stock and making up trains will give you hours of pleasure. Hornby Trains are beautifully finished, strongly made, and will last for ever. One of their most valuable features is that all the parts are standardised, and any lost or damaged part may be replaced with a new one.

Every train is guaranteed, and you are therefore sure of satisfaction if you buy a Hornby.



No. 2 PULLMAN SET

No. 2 Pullman Set

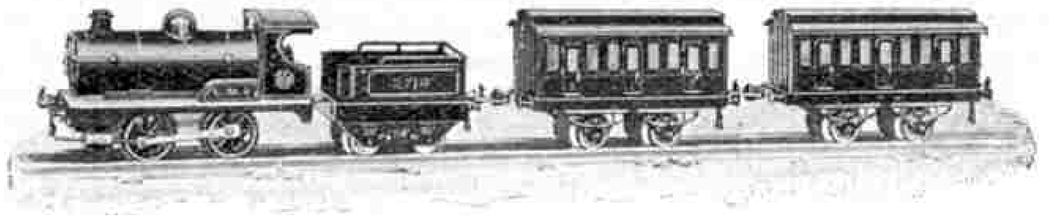
The No. 2 Loco with Tender measures 17 in. in length. The Loco is fitted with superior mechanism and the accurately-cut gears ensure smooth running. Loco, Tender and Coaches are superb in appearance and finish, enamelled in colours and stoved at a high temperature to ensure durability. The Loco is fitted with reversing gear, brake and governor.

Gauge 0 in colours to represent the L.M.S. or L.N.E.R. Companies' rolling-stock. Each set contains Loco, Tender and two Coaches, with set of rails to form a circle of 4 ft. diameter. Price 60/–.

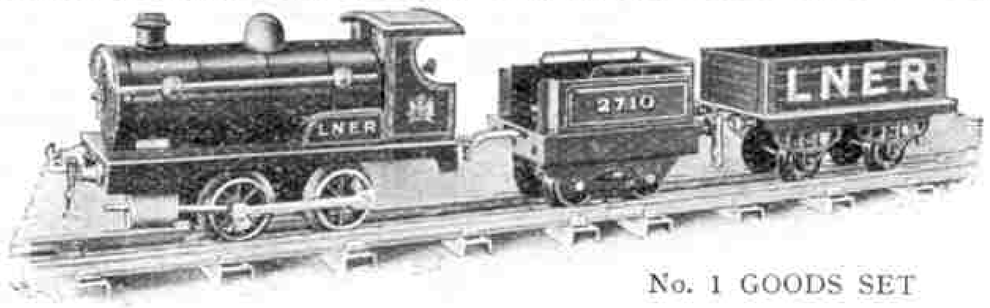
No. 1 Passenger Set

The Loco is fitted with reversing gear, brake and governor. Loco, Tender and Coaches are superb in appearance and finish, enamelled in colour and stoved at a high temperature to ensure durability. The doors of the Coaches open.

Gauge 0 in colours to represent the L.M.S. or L.N.E.R. Companies' rolling-stock. Each set contains Loco, Tender, two passenger coaches and set of rails consisting of two straights and curves to form a circle of 2 ft. diameter. Price 30/–



No. 1 PASSENGER SET



No. 1 GOODS SET

No. 1 Goods Set

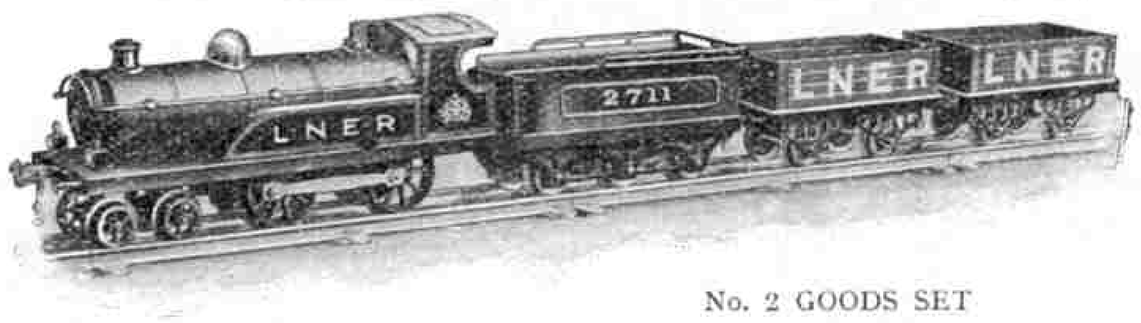
Gauge 0 in colours to represent the L.M.S. or L.N.E.R. Companies' rolling-stock. Each Loco is fitted with reversing gear, brake and governor. Each set comprises Loco, Tender, one Wagon, and set of rails as in the No. 1 Passenger Set. Price 22/6

No. 1 Hornby Loco Price 15/–
" " Tender " 2/6
Hornby Passenger Coach Price 5/–
No. 1 Hornby Wagon " 2/6

No. 2 Goods Set

Gauge 0 in colours to represent the L.M.S. or L.N E.R. Companies' rolling stock. This set contains Loco, Tender and Rails as in the No. 2 Pullman Set, and two Wagons. Loco fitted with reversing gear, brake and governor. Price 37/6

No. 2 Hornby Loco ... Price 22/6
" " Tender " 3/6
Hornby Pullman or Dining Car ... Price 15/–
No. 2 Hornby Wagon " 3/6



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II. POINTS AND CROSSINGS: SIMPLE LAYOUTS

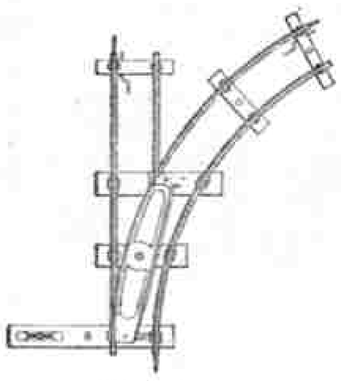

Fig. 1

LAST month we described the chief features of the various types of locomotives in the Hornby train system, and now we must turn our attention to the track itself. The simplest rail formation is, of course, a circle, but merely running trains around a circle soon becomes monotonous. Although a circle may be converted into an oval of any desired length by the insertion of straight rails, this does not improve matters very much, and in order to introduce variety we must make use of points or crossings.

Hornby System Points

Points are employed to enable a train to be transferred from one line to another. They consist of two moveable rails called "switch-tongues," placed on the inner side of running or "stock" rails which do not move. The switch-tongues are worked from side to side by a rod operated by a lever. Fig. 1 shows an illustration of Hornby Right-hand Points, the purpose of which is to divert a train from the straight main line to a curved line branching off to the right. The actual course of the train, that is whether it shall continue along the main line or take the branch line, is determined by the way in which the points are set. For instance, if we wish the train to continue along the main line the points must be set as shown in Fig. 2.

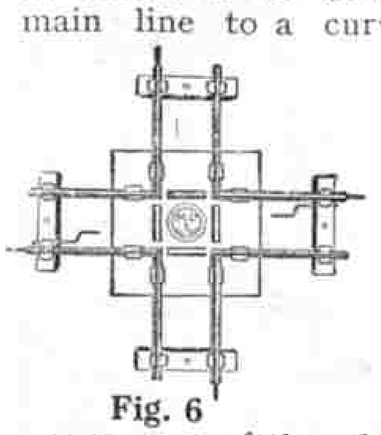

Fig. 6

The flanges of the wheels pass along the inside of the rails, and therefore on reaching the points the left-hand wheels would continue along the stock rail while the right-hand wheels would pass along the right-hand switch tongue. Thus the points would have no effect on the train, which would continue along its original course.

In order to divert the train to the branch line the switch-tongue must be pulled over by means of the lever into the position shown in Fig. 1. In this case the right-hand wheels of a train, on arriving at the points, obviously would follow the stock rail while the left-hand wheels would pass along the left-hand switch-tongue, with the result that the train would be diverted to the branch line.

Diversion to a line branching away to the left of the main line would be effected by means of Left-hand Points working in exactly the same manner, but in the opposite direction.

In addition to the ordinary Right-hand and Left-hand Points the Hornby system includes Double Symmetrical Points, Fig. 3, and Parallel Points, Fig. 5, the purpose of which is evident from their design. These points work on exactly the same principle as the points just described, and their action is quite easy to understand.

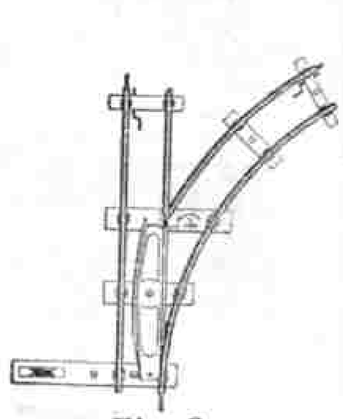

Fig. 2

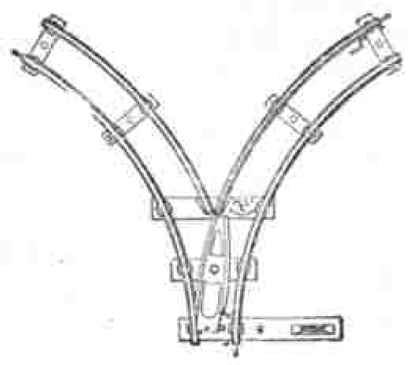

Fig. 3

The design of the points in the Hornby system is based upon that of the points on real passenger-carrying railways, and therefore there is little difference in principle between the two, although the latter are fitted with certain safety devices. One of these safety devices consists in the provision of check rails laid inside the stock rails to prevent the possibility of the wheel flanges mounting the rail.

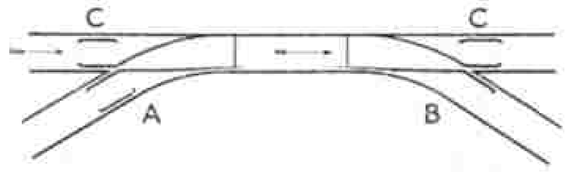

Fig. 4

"Facing" and "Trailing" Points

Points are known as "facing points" or "trailing points" according to whether they face the direction of an on-coming train or not. Fig. 4 shows trailing points at A and facing points at B, with check rails at C. Generally speaking, trailing points are used wherever possible in making crossings from main lines on account of their safety in the event of incorrect setting of the points. In order that a train shall pass safely over points it is essential that the tip or "toe" of one of the switch-tongues shall be against the stock rail so that the wheel flanges cannot pass between the two. In the case of facing points, failure to set the switch-tongues correctly would most probably result in derailment of the train, because the wheel flanges would either get between the toe of the switch-tongue and the stock rail, or strike and mount the toe. With trailing points derailment would not follow incorrect setting,

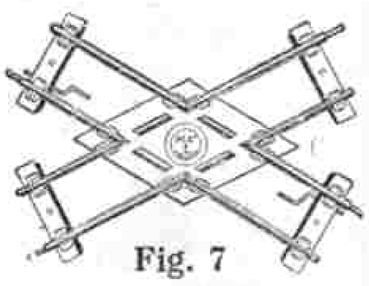

Fig. 7

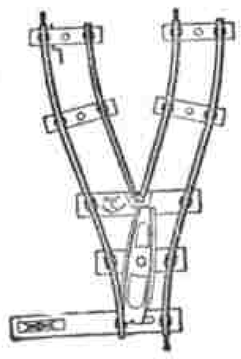

Fig. 5

(*Continued on page* 337

New Rolling Stock and Accessories

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There are now 50 different train accessories—Stations, Signal-boxes, Lamps, Wagons, Level-Crossings, Foot-Bridges, Turntables, etc. Further accessories will be added to the system from time to time, and will be announced in the pages of the "*M.M.*"

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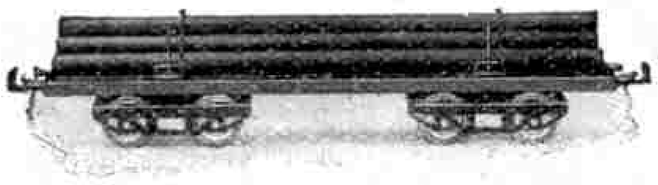

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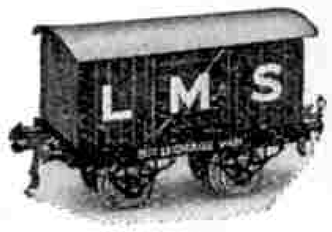

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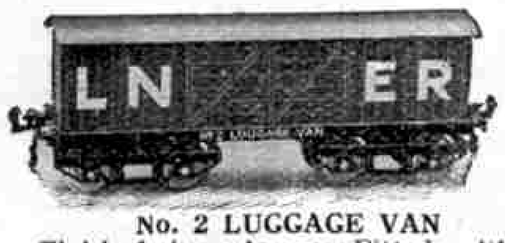

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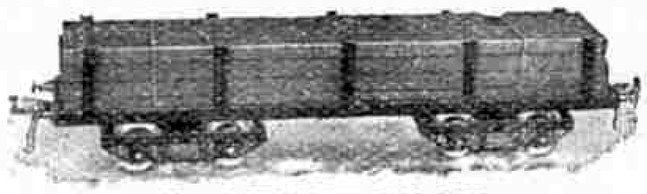

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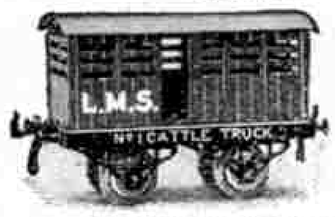

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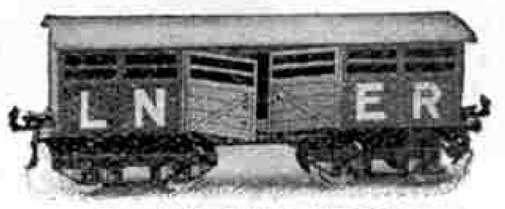

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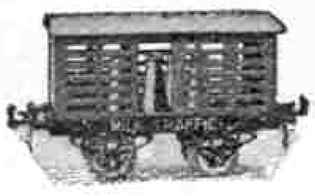

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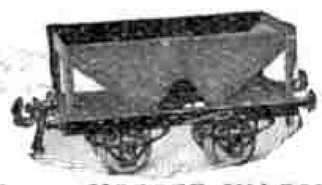

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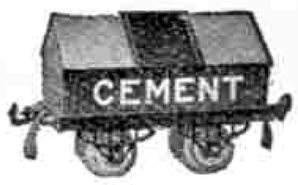

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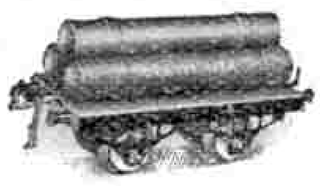

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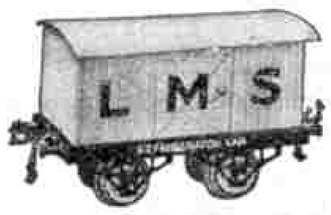

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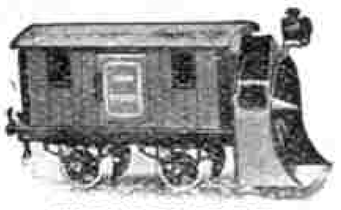

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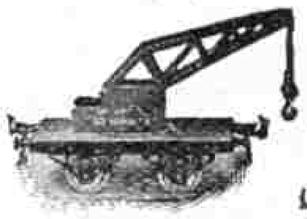

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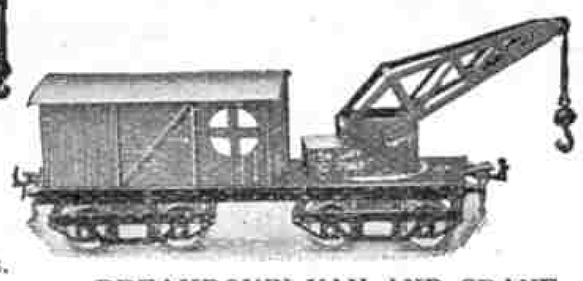

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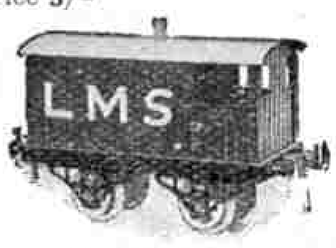

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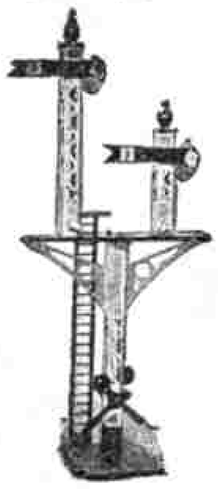

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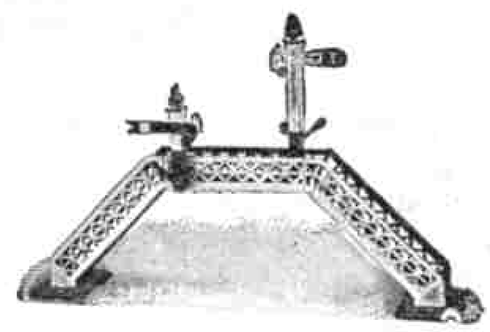

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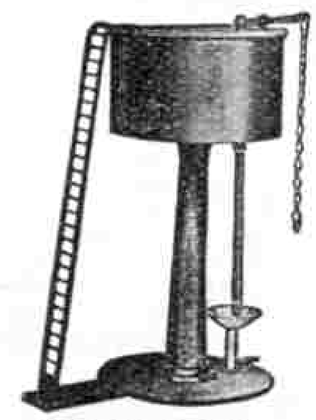

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A Miniature Railway System—(*continued from page* 335)

however, because the wheels of the loco would force the switch-tongues out of the way, and the train would pass on in safety.

On all passenger lines special safety appliances are fitted at facing points. These appliances make it impossible for a train to be sent over the points unless the switch-tongues are in the correct position, and they also prevent a signalman from altering the points until the wheels of the rear vehicle have passed clear.

Points are controlled from a signal box and are operated by means of iron rodding. Their working is, of course, closely connected with signalling operations, and we shall refer to this later when dealing with signals.

Hornby Crossings

Besides the various points, the Hornby system has two types of crossings, the Acute-angle or diamond crossing, Fig. 7, and the Right-angle Crossing, Fig. 6. These have no moveable parts and, of course, are always in the correct working position.

All the points in the Hornby system are made in two different sizes for curves of 1 ft. radius and 2 ft. radius respectively. If large radius rails are being used, then large radius points are necessary, while the small radius rails require small radius points. This is very important, and in buying points great care should be taken to specify the particular radius required. The use of small radius points with the No. 2 Loco or No. 2 Tank Loco always involves derailments, for these bogie-locos cannot negotiate the small curve with safety, unless running very slowly. It should be added that the ordinary Right-hand and Left-hand Points are also made on the 9 in. radius scale to suit the 9 in. radius rails of the "George V" train sets.

The two types of crossings—Acute-angle and Right-angle—do not involve curves and are therefore made in one size only.

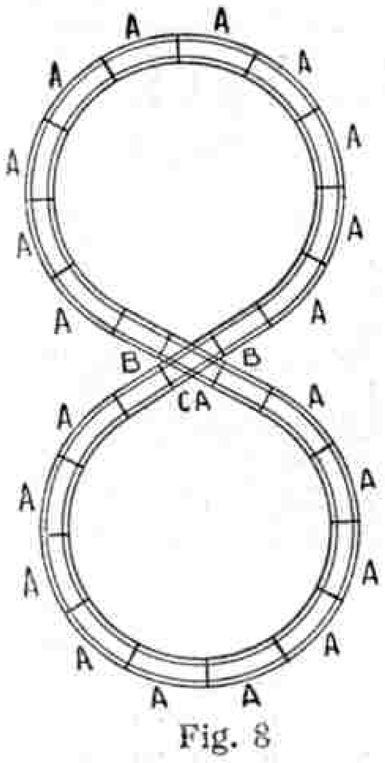

Fig. 8

A Simple Layout

Now let us suppose that we have become tired of a simple circle or oval track and are considering methods of developing our layout. Perhaps the simplest scheme is that shown in Fig. 8. Here the only new element is the Acute-angle Crossing (CA), but its use certainly produces a layout of much greater interest. Using the 2 ft. radius rails, 20 Curved Rails (A2) and 4 Straight Rails (B1) are required, in addition to the Acute-angle Crossing (CA). With 1 ft. radius rails, 10 Curved Rails (A1) and 4 Straight Quarter Rails ($B\frac{1}{4}$) are needed. The four Quarter Rails occupy the same position as the four Straight Rails (B) in the diagram.

By altering slightly the shape of this layout a Right-angle Crossing may be substituted for the Acute-angle Crossing. Fig. 9 shows the modified arrangement. In addition to the Right-angle Crossing (CR) the rails required are 18 Curves (A2) and 8 Straights (B1) for the large radius rails; and 8 Curves (A1), 2 Half Curves ($A\frac{1}{2}$), 4 Half Straights ($B\frac{1}{2}$) and 4 Quarter Straights ($B\frac{1}{4}$) for the small radius.

Interesting Experiments

Layouts such as these are very simple, but a great amount of fun may be had with them. They provide us with a long stretch of continuous run and are therefore particularly useful for experiments in speed and hauling power. Many happy hours may be spent in timing a loco round the track with different loads behind it and in testing its hauling powers to the last ounce. If two locos are available it is very interesting to compare their capabilities in speed and power, and also in regard to the time taken in picking up speed.

The possibilities of braking and reversing from the track should not be forgotten, and the use of the rails specially made for this purpose adds greatly to the interest of the layout. If the large radius rails and locos are being employed quite an exciting time may be had by using two or more of the special rails. Two trains then may be started off in opposite directions from different points on the track and the apparently inevitable and disastrous collision averted at the last moment by skilful manipulation of the reversing or braking mechanisms.

The weak point about all layouts of this character is that the course of the train cannot be controlled, apart from simple reversing. Half the fun in playing with toy railways lies in being able to divert our trains to a branch line or siding whenever we wish, and in order to do this we must develop our layout still further.

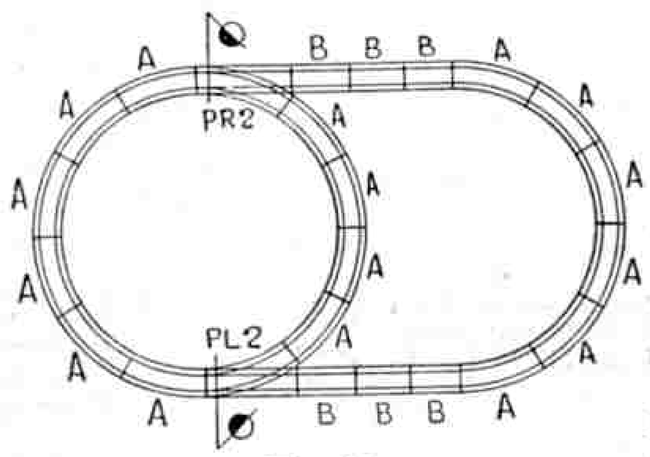

Fig. 10

Developing our Track

A simple but useful layout is shown in Fig. 10. It will be seen that this consists of a combination of our old friends, the circle and the oval. We now have the power to control the course of our train, the two sets of points enabling us to send it along the outer oval or to divert it round the inner circle. This little layout is an excellent one for demonstrating the working of Right-hand and Left-hand Points, and also for showing the necessity for constant watchfulness in regard to the setting of the points. It is surprising how easy it is to overlook the fact that certain points are wrongly set. We get so interested in watching the train as it forges its way in business-like fashion along the track that we quite forget t at the setting of the points it is rapidly approaching is wrong, and the resulting derailment is really very exasperating. With large and complicated layouts having several branch lines and sidings the control of the various points becomes quite exciting. There is very little time to manipulate the levers so as to make the necessary changes, and one needs to be constantly on the alert if derailments or collisions are to be avoided.

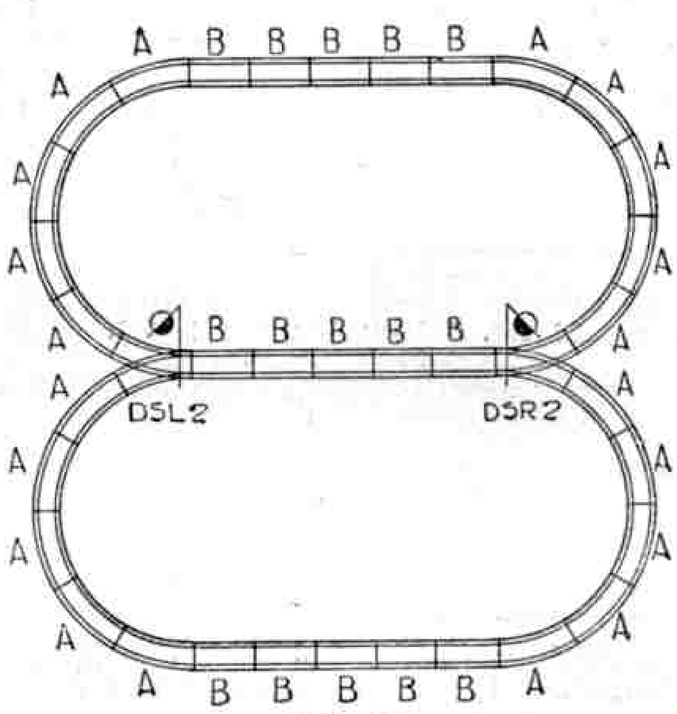

Fig. 11

A simple layout like that in Fig. 10 provides lots of fun, and at the same time it gives excellent practice in the art of line control. One learns to keep one eye on the train and the other on the points, so to speak, and to realise quickly what will be the effect of certain settings upon trains running in different directions.

The component parts for the layout in Fig. 10 are:—Large Radius—16 Curves (A2), 6 Straights (B1), Right-hand Points (PR2) and Left-hand Points (PL2). Small Radius—7 Curves (A1), 4 Straights (B1), Right-hand Points (PR1) and Left-hand Points (PL1).

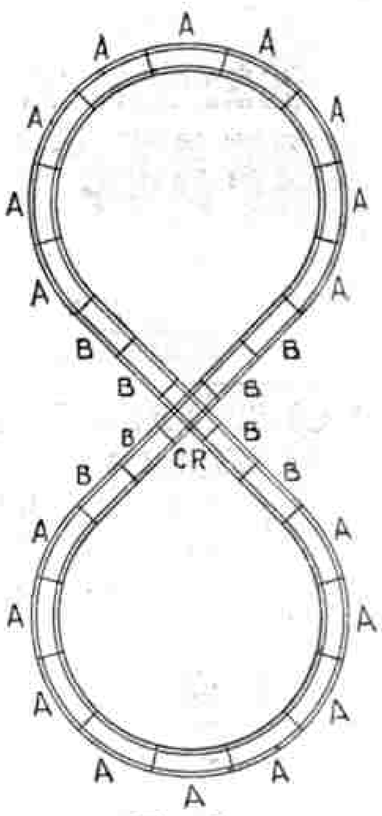

Fig. 9

Other Rail Plans

The foregoing layout may be further developed in various ways if more straight and curved rails are available, without the need of any additional points. Instead of having the circle inside the oval it may be placed outside, at a point half way along one of the straight sides. Other similar plans will quickly suggest themselves, and it will be found that the only limiting factor is that of the space available. For those fortunate boys who have plenty of room at their disposal the layout shown in Fig. 12 can be strongly recommended. This

(*Continued on page* 344)

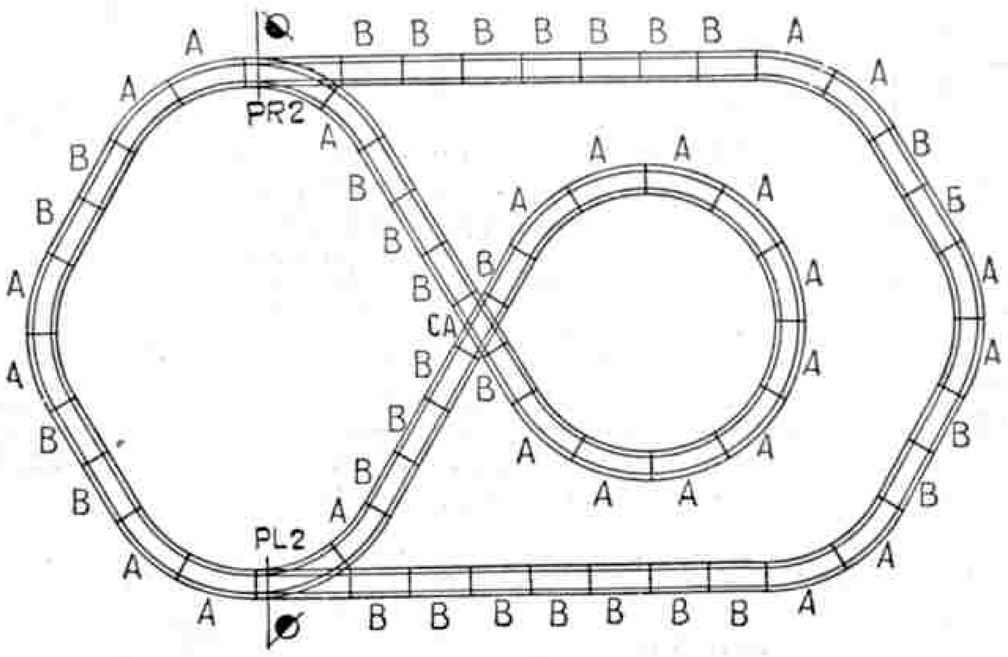

Fig. 12

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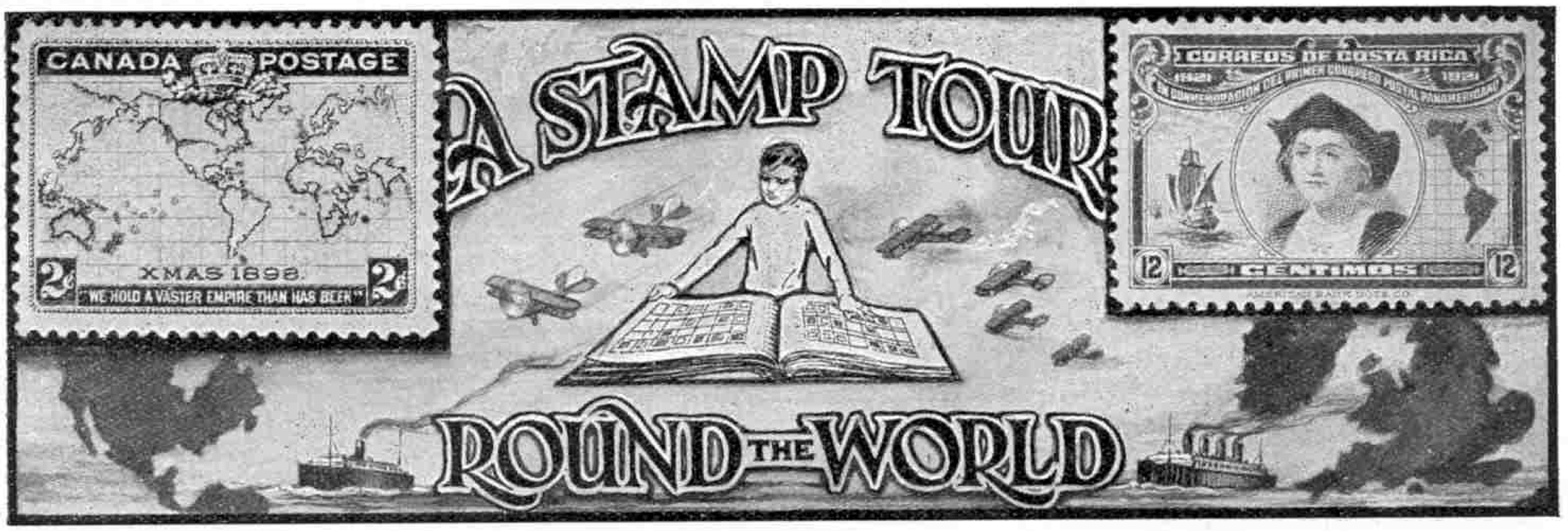


III. UNITED STATES, BERMUDA AND THE WEST INDIES

HAVING fully explored the Niagara Falls we again board our aeroplane and fly north-west for nearly 400 miles. At length we reach the town of Sault Sainte Marie, the canal locks of which are pictured on the 8c. value of the 1901 issue illustrated on this page.

From Sault Sainte Marie to Washington

Sault Sainte Marie is situated in the State of Michigan at the point where Lake Superior flows into Lake Huron, and opposite the Canadian town of the same name. In 1668 Jacques Marquette founded the first permanent colony in Michigan at this point, and to-day the town of Sault Sainte Marie has a population of rather over 12,000. The river between the two lakes is about a mile in width at this point and has a fall of about 20 ft. in three-quarters of a mile. In 1855 the original canal (5,700 ft. in length) was built by the State, but since that time it has been widened and deepened and several large locks have been added.

Our aeroplanes now turn towards the Atlantic, and after a flight of about six hundred miles over vast stretches of farming land similar to that shown in the 2c. of the 1898 issue, we arrive at Washington to see the Capitol and the Lincoln Memorial. Both these are pictured on stamps of the current issue, the former on the 2 dollar and the latter on the 1 dollar value. The Capitol, the seat of the United States Government, stands on rather higher ground than its surroundings, and commands a splendid view of the city. It has a dome similar to that of St. Paul's Cathedral. The Lincoln Memorial is a massive building (it took ten years to build) but owing to its perfect proportions, it does not at once impress one with its size. The thirty-six columns surrounding the outside of the building represent the number of states in the Union at the time of Lincoln's assassination. Within the building there is a Memorial Hall and a huge statue of the great President.

A Great Floating Dock

At New York we join our liner again and set sail. As we leave the magnificent harbour we see the wonderful Statue of Liberty, presented to the United States by France in commemoration of the Declaration of Independence, and pictured on the 15c. value of the current issue. One does not usually associate a statue with engineering, but the construction of this massive work was a great engineering feat, in being an early example of ferro-concrete construction.

Bidding farewell to the States, we make our way to the island of Bermuda, where is located the famous floating dock. The floating dock arrived at the island from the Tyne in 1902 and is depicted (not very successfully we may say) on certain values of Bermuda issued 1902-1910. The 1902 dock superseded another floating dock that had been at the island since 1869, but which could not accommodate the larger modern battleships. Accordingly the new dock was built and towed to Bermuda, where it is an important factor in the defence of the Atlantic. In three-and-a-half hours it can lift a vessel weighing up to 15,000 tons!

A Stamp that Nearly Caused a War

Our next port of call is at Hayti, where we visit Port au Prince, the capital. There are many splendid view stamps of this town included in the 1906 issue. The 3c. shows the Market Hall; the 8c. the entrance to the Catholic College; the 10c. the Catholic Monastery and Church; the 15c. the Government Offices, and the 1 piastre the Palace of the President. Hayti has been a negro republic since 1804, when an insurrection freed it from France.

As our liner will probably spend a few days in "coaling" at Port au Prince we shall have time to fly over to Gonaives, a town of 18,000 inhabitants on the western coast of the island. There we see the Independence Palace (1906, 7c.). After leaving Gonaives we turn inland and arrive at Sans Souci, near Millot, where are the ruins of the magnificent palace of Sans Souci, and the fortress of La Ferriere (1906, 4c.), built by King Henri Christophe.

The Republic of Dominica occupies the eastern portion of the same island, and here we see the fortress at Santo Domingo (1902 issue, 50c.). In passing we may mention the "map" stamp of the Dominican Republic (1900 issue, all values). When compared with a map of the island it will be seen that the issuing country has given itself a much greater portion of the island than it owns. In fact, it made itself look so important that it is said that the issue of this stamp nearly caused a war between the two republics!

A Handsome Stamp

Continuing eastward for about 500 miles, we arrive at Pointe-à-Pitre, Guadeloupe (1905 issue, Franc values). This is the chief port and most important town in the island, and lies at the mouth of the Rivière Salée. Guadeloupe is a French colony and consists of two islands, Grande-Terre, on which Pointe-à-Pitre stands, and Basse-Terre, a very beautiful island with high mountains, amongst which are to be found Mount Houllemont (1905 issue. 1c. to 15c.) and La Soufrière (20c. to 75c.). The latter is the highest mountain in the island, rising 4,900 ft. above the sea. It is a volcano, but although it destroyed several towns in 1843 its hot springs and vapour are the only signs of volcanic activity to-day.

(Continued on page 357)

(Continued)

IN the Government Building there are three large rooms devoted to exhibits by the Navy, Army and Air Force. In the first room there are numerous glass cases in which are shown perfect little models of British ships at various periods. As I looked at the models of the ships that fought the Spanish Armada, I thought how clean-cut and business-like our ships are to-day as compared with the wonderfully-carved, elegantly-painted ships of the Elizabethan period.

The "Mystery Ship"

In the centre of this room are two splendid models of present-day men-of-war. Every detail is perfect—the wireless aerials; the rails ready to be folded up when the ship goes into action; ventilators; tiny ladders and doors; perfect guns—all are exact in proportion and finish, down to the smallest detail. Another case shows a model of one of our "mystery ships"—a peaceful, defenceless trader on the one hand and, when its true nature is revealed, shown in its true colours as a fighting ship ready for action.

The Air Force exhibit includes a splendid full-sized aeroplane engine working away in a glass case! The centre of the room is occupied by a model showing war-ships, with aeroplane-carrying ships lying near their base, where the ammunition sheds and hangars are located. By pressing little switches arranged around the frame-work of the model, miniature electric bulbs light up and show more clearly the position of the special features of the model.

Letters from the "Iron Duke"

Another model called "Somewhere in France"—one of the War Office exhibits—shows a section of the battle-front. There are miniature trenches, barbed wire, gun emplacements, dug-outs, and even tanks, all of which give a very clear idea of what the "real thing" must have been like. It was topping to be able to press a switch marked "Concealed Observation Post" and then to see a shattered tree light up from the inside and reveal itself as a tower with a ladder and a platform at the top, or to press the "Disabled Tank" button and find a deep ditch and a few bushes hiding a tank shattered and disabled by shell fire.

There are also several suits of armour, cannon and weapons of all periods, and tableaux of famous battles such as Hastings, Aboukir, and many others. Letters written by the Duke of Wellington on the battlefield are also shown, together with such interesting objects as the insignia and orders actually worn by Florence Nightingale. It was wonderful to think that here, right beside me, were papers and orders touched and used by people of whom I have so often read.

Photograph by [*Master H. Green, Daventry*

The Burmese Pavilion

I next went to see the performance at the Admiralty Theatre, where the bombardment of Zeebrugge is shown. My word, it was "some show." First of all a gentleman appeared before the curtain and told the story of the attack on Zeebrugge. He made us all so excited that he had to wait several times until the clapping and cheering had died down!

A Deed of Great Daring

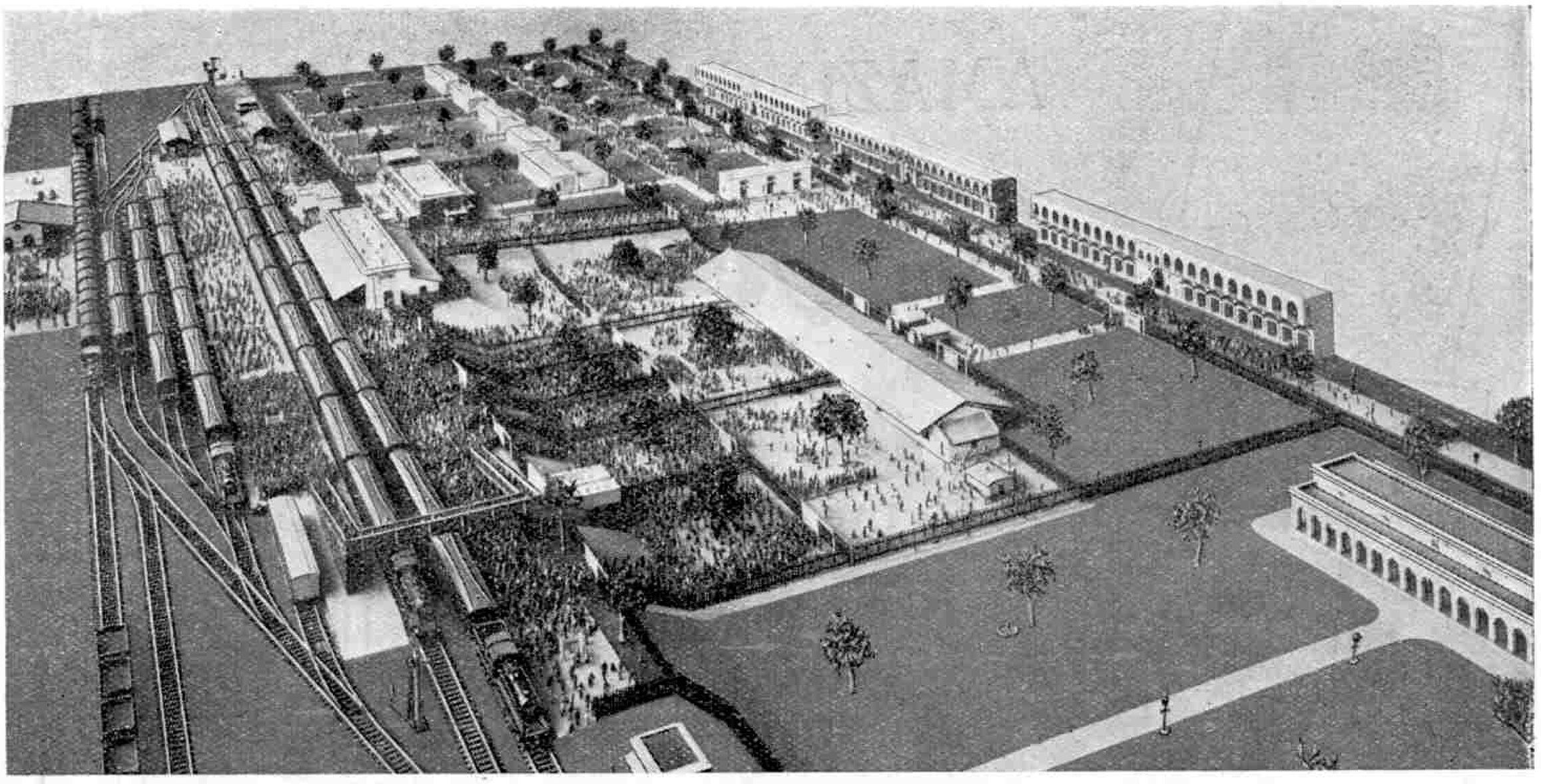
When the show was ready to commence I could scarcely sit still for excitement! There, in front of our eyes—taking the whole width of the stage—was a perfect model of the harbour of Zeebrugge, with the "Mole," as the famous breakwater is named, guarding the entrance to the Bruges Canal.

Then, amidst great excitement, the show commenced. The scene is laid at sunset when several German destroyers and submarines return to harbour. After darkness has fallen there is a noisy bombardment of Zeebrugge by British ships far out at sea. Shells burst on the land far behind the Great Mole. British motor launches creep along the coast putting up a smoke-screen, under cover of which the "*Vindictive*" comes up alongside the Mole. Owing to the strong wind and tide she cannot land her men for the attack, but the brave little "*Daffodil*" (which in peace-time is a ferry-steamer on the Mersey) sees her difficulty and pushes the "*Vindictive*" in to the Mole with her bows, keeping her there whilst the men are landed. The "*Iris*" (another Mersey ferryboat) gets alongside the Mole and bombards the German seaplane station. Just as the fighting on the Mole becomes fiercest, and shells from the battleships are bursting all around, the Submarine CIII, laden with explosives, makes for the shore end of the Mole. Here she dives and her brave crew blow her up, making their escape in a small boat. Communication with the land is thus broken and the Germans on the Mole are cut off from assistance from land.

"The Mission Accomplished"

The real object of the expedition was, of course, not so much to destroy the Mole as to block up the entrance to the Bruges Canal. Immediately the viaduct is destroyed the three block ships sail up, and as the "*Thetis*" is so badly hit she cannot reach the entrance to the canal, she is run ashore—a blazing wreck. She continues to carry on her duty, however, and signals the two other ships, which, through her guidance, are able to safely enter the canal, where their crews sink them.

The entrance to the canal now being completely blocked, the work of rescuing the crews is carried out by motor boats manned by officers and men of the R.N.R. and R.N.V.R. Time after time these little motor-boats return—for the order had gone out that not a single sailor was to be left to the mercy of the enemy—until all the living, and as many of the dead as possible, are brought back. Meantime, the storming party on the Mole return to



The Wonderful Model in the Indian Pavilion

This model, exhibited by the Oudh and Rohil Khand Railway, was described in our last issue. It shows a typical wayside station, the platforms crowded with passengers. As most of the passengers are unable to read or write, a very ingenious system has been devised. Upon stating their destination and paying their fare, the passengers are given tickets of different colours according to their destination. Near to the platforms are large compounds or enclosures, at each of which a flag of distinctive colour is flown. The passengers enter the compound that has a flag agreeing in colour with their ticket, and thus all the passengers for a particular town are in their correct compound. It is then an easy matter for the gates of any particular compound to be opened when the train for their destination comes in.

the "*Vindictive*," the recall having been sounded on the "*Daffodil*" syren, and then the gallant little ship, riddled with shell-holes, edges away, and allows the "*Vindictive*" to leave with the victors. Instead of a thrilling tale appearing in our press next day, the Admiralty merely told us that an attack had been carried out on Zeebrugge and that the attackers had "returned with the mission accomplished!"

Exhibits from the East

After seeing this thrilling display, I left the Government Building and visited Burma. The carving of the wooden roof and towers of this building is wonderful, the three towers being hung with gilded bells that "tinkle" in the wind. I was surprised to learn that it was modelled in Burma—as was also a shrine with its marble Buddha—being worked in Rangoon and shipped to Wembley in huge packing cases.

In this building is a wonderful display of valuable stones; beautiful ivory carvings; work in mother-of-pearl and lacquer; silver and bronze figures; furniture wonderfully and delicately made; and an exhibit of 60 varieties of timber. Two live Burmese elephants are stationed in the grounds, and a native theatrical party, with wonderful little Burmese dancing girls, give regular performances to the accompaniment of weird native music.

"Pearls of Great Price"

Next I passed to Ceylon, the pavilion of which is fashioned on the model of a Temple at Kandy. This building is a store-house of beauty. Many wonderful jewels are on view—mostly rubies and sapphires—and I was told that some of the single stones are valued at £20,000! One exhibit, a pearl necklace with each pearl a different colour, required 30 years to collect!

Then there was a splendid display of rubber from Ceylon. I had no idea rubber could be used in so many forms—there were mats, bathing caps, lampshades, cushion covers, wonderfully-coloured cigarette cases and even paper—all made from rubber. Next I encountered a strong spicy smell, which I found came from a room devoted to spices—pepper, nutmegs, mace, cloves, cinnamon, etc. I could fill pages in a description of the things I saw—native industries, cloth-weaving and dyeing, and baskets woven with delightfully-coloured designs—elephant heads, buffalo and spotted deer and many other trophies of the chase.

Hong Kong and Malta

Hong Kong was my next destination. I found it to be a long native street with a Chinese restaurant, with real Chinese food, Chinese waiters and Chinese music—which sounded great from outside! The native shops in Hong Kong are quaint affairs quite open to the street, and you just step up and walk about, admiring and purchasing the goods if you wish. This was one of the quaintest corners I had struck, and I was just longing to sample the Chinese food—"Birds' Nest Soup," Stewed Sharks' Fins and other delicacies—served at the restaurant, but I knew I would have to hurry on.

Malta, my next port of call, contains exhibits which go back 30 centuries before the Christian era, but as this sounded too much like ancient history I did not stay long there! I was more interested in the pictures of the galleys that forced the Dardanelles in 1656 and in the armour, weapons and trophies shown.

Our Dominions

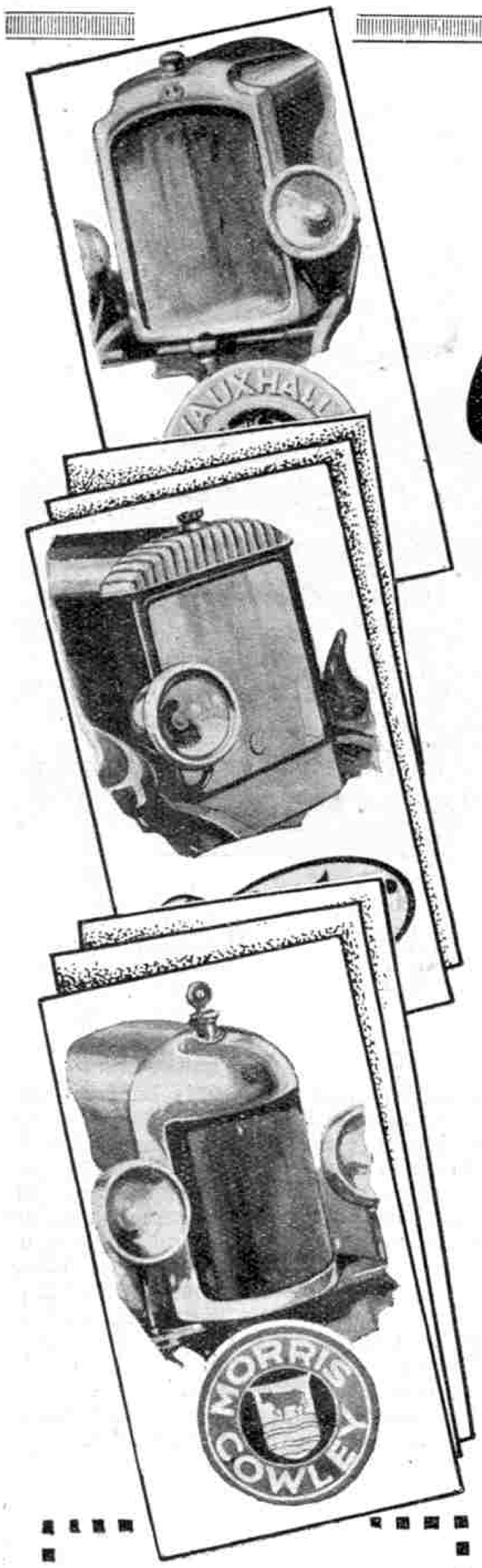
South Africa's pavilion is built on the lines of an old Dutch House, with stoep and loggia complete. Above the main entrance is a statue of Jan van Riebeek, who sailed to Table Bay in the days of Queen Elizabeth. An interesting exhibit here is a railway saloon and restaurant car in which meals are served. Then there is a complete plant for washing, cutting and polishing diamonds, and a most realistic display of stuffed animals in their natural surroundings. Wool, hides and skins are important exhibits, and a free cinema with films depicting South African life is very popular.

The Prince of Wales in Butter

Canada's wonderful building covers nearly 6 acres of ground. Round the walls are panoramic pictures—constructed entirely of grain of different colours—below which are wonderful tableaux of the country, with running water, and working models of electric trains. We are told that within the next twelve years Canada will be growing one billion bushels of wheat per annum! But Canada yields not only wheat, but also mineral wealth—gold, silver, nickel, copper, and asbestos—and the section devoted to minerals is unique. Ores and rocks are set out, and wonderful scenes are built into the walls.

One of the most amazing exhibits I ever saw was in this building. It was a life-sized statue of the Prince of Wales standing by his horse, modelled entirely in butter! In the background is the Prince's ranch with flowers and shrubs and trees all complete. The two life-sized figures are perfect in every detail. The case containing the statue is kept cool by a special refrigerating plant, which maintains the temperature inside the case below zero.

(To be concluded)



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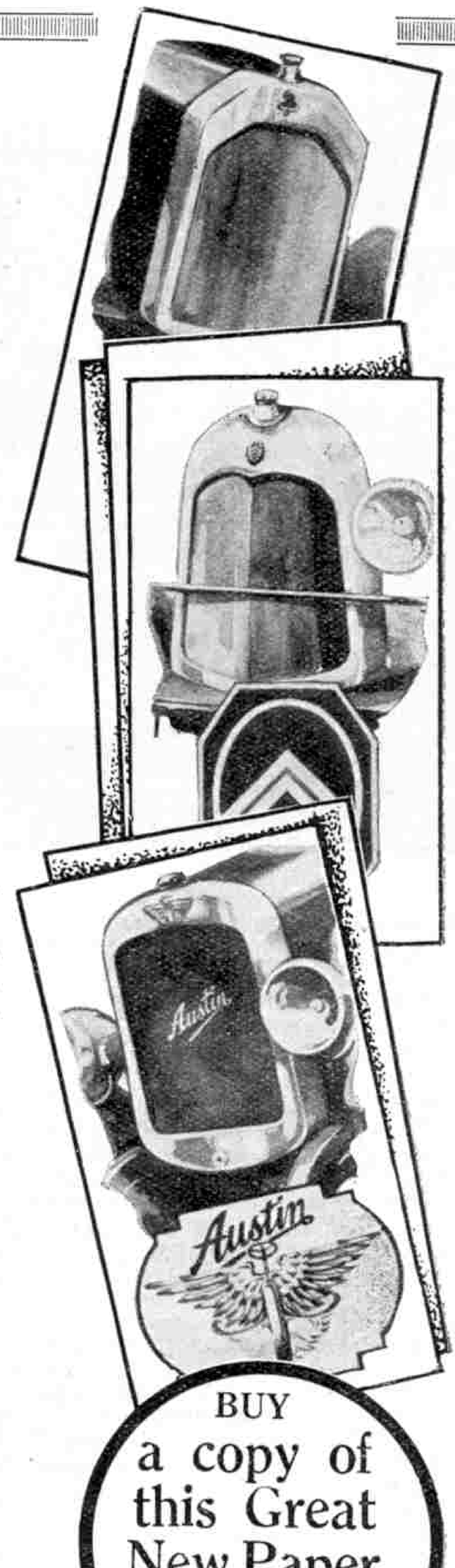

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will be packed tight with bright and breezy stories. A cheery crowd of TRIUMPH heroes will thrill and entertain you week by week in exciting and breathless exploits of adventure, baffling mystery—enthralling stories of football and of side-splitting fun.

Be wise, lads, and order your copy NOW. You will enjoy every line of it, and so will your pals.

New Coaler Lifts 10-ton Wagon and Coals Two Locos in Two Minutes

SHOULD any reader of the "*M.M.*" pass through Crewe on the London, Midland, and Scottish Railway, he should keep a sharp look out for the very interesting automatic loader illustrated on this page. It stands by the south Steam Sheds, on the left of the main line going northwards. With good fortune it may be seen at work coaling a locomotive.

This wonderful new coaling appliance has introduced the maximum efficiency and economy into the coaling of locomotives.

Coaling Locos by Hand

The ordinary method of coaling locomotives has long been regarded as unsatisfactory, especially at such centres as Crewe, which is one of the busiest railway depots in the world. This method, which originated about the time of the famous "*Rocket*," consists of handling the coal by means of shovels and baskets. About twenty minutes are required to coal an engine in this manner, and the work is by no means pleasant for the workmen.

Coaling by hand in this way requires a large number of men. It is so slow in operation that often the time gained by expresses is lost when their locos have to wait their turn at the coaling depots.

Coaling Locos in Two Minutes

Many attempts have been made to eliminate this clumsy and out-of-date method, and the appliance shown in our illustration is one of the most practical. This new coaling plant enables the operation of coaling to be carried out with considerably greater efficiency than was possible with the old method.

The towering structure is built alongside a storage bunker of re-inforced concrete, and is one of the largest mechanical devices in use to secure economy in railway working. The whole operation of taking the coal from the wagon, placing it in the store, and feeding it out again through a measure-chamber to the locomotive beneath, is completed in under two minutes. The plant contains six chutes by which the requisite quantities of coal are delivered, according to the type of locomotive to be coaled. It is quite practicable to coal on two lines at the same time.

Coaling with such a plant as this not only effects an immediate saving of nine-tenths of the actual coaling time, but the delay occasioned to locos waiting to be coaled is eliminated, and thus less time is lost in standing. Moreover, the army of coal trimmers necessary with the older method of hand-coaling, are relieved of their unpleasant and dirty labour and are enabled to work elsewhere to better advantage.

Bodily Lifting a 10-Ton Wagon

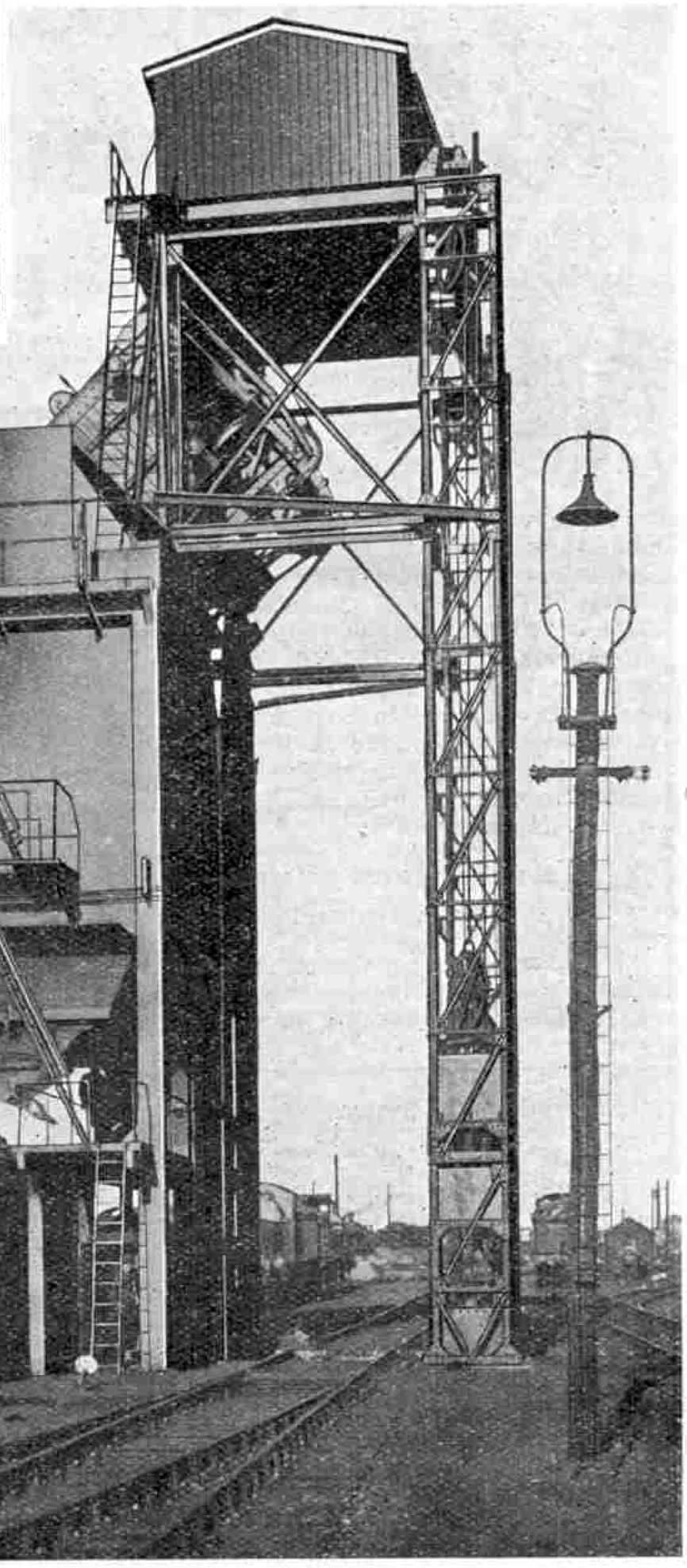
As is shown in our illustration, the steel tower, with the winch-house overhead and the reinforced concrete bunker, is placed at the side of the third rail track on which runs the train of coal wagons. When the train arrives from the colliery, each wagon is detached and run to the coaling appliance, on the cradle of which is laid a portion of the standard rail track. When the electrical control is brought into operation, the cradle and wagon are raised vertically to a height of 32 ft. Balance weights equalise the dead-weight of the cradle, wagon, and load, and effect the maximum economy in consumption of power.

When fully elevated, the cradle engages with trunnion pins and commences to rotate in the direction of the bunker mouth, which—as will be seen from the illustration—is enclosed by a wind-screen. The distance travelled by the wagon in rotating is sufficient to tip the coal smoothly and easily into the bunker, which is capable of holding the contents of twenty-five 10-ton wagons. The capacity of the bunker is sufficient to coal all the locomotives at Crewe during a normal twelve-hour working day.

One Man Control

An automatic device effectually secures the wagon in its place in the cradle whilst it is being elevated to the bunker and returned to the ground. After discharge, the wagon returns to its normal position, and the cradle descends to the rail level. Here the empty wagon is disengaged and run-off, allowing the next full wagon to take its place in the cradle.

The whole operation of raising, tipping and lowering the wagon is controlled by one man, by means of a simple switch



Photograph by courtesy] [*Messrs. The Mitchell Conveyor & Transporter Co. Ltd.*

The above illustration shows a 10-ton Wagon being tipped into the New Coaling Appliance at a height of 32 ft. from the ground

CHOOSE YOUR OWN CHRISTMAS PRESENT

An opportunity for "*M.M.*" readers

It is a wonderful sensation to sit down and study illustrations and descriptions, and select your own Christmas present. Try it! The Special Christmas Number of the "*M.M.*" will contain advertisers' announcements of all kinds of splendid toys, books, and all manner of articles for giving pleasure to boys at Christmas. We are going to make at least one boy happy by giving him the very thing he wants, from amongst the articles advertised in our columns.

Let us know what you want—

On a Postcard

Obtain a copy of the Christmas number of the *Meccano Magazine*, which will be ready on 1st December, look at *all* the articles advertised and then decide which you would like the postman to hand to you on Christmas morning. Write the name of it on the top of your postcard, marking it No. 1. Then write the name of the article that you would like second best and mark it No. 2. Do this with six articles altogether, write your name and address at the bottom in very plain letters, and send the postcard to "Christmas Presents, *Meccano Magazine*, Binns Road, Liverpool."

To the boy whose list corresponds most nearly in order of merit with the total voting we will post the article that heads his list, to reach him on Christmas morning.

"Christmas Presents" postcards must reach us not later than 20th December.

Miniature Railway System—

(*Continued from page* 337)

rail plan is more interesting than perhaps it appears, and if two separate trains are used many hours of fun and excitement may be obtained. The pieces required are:—Large radius—24 Curves (A2), 30 Straights (B1), Acute-angle Crossing (CA), Right-hand Points (PR2) and Left-hand Points (PL2). Small radius—11 Curves (A1), 12 Straights (B1), 4 Quarter Straights ($B\frac{1}{4}$), Acute-angle Crossing (CA), Right-hand Points (PR1) and Left-hand Points (PL1).

Fig. 11 shows a formation making use of the Double Symmetrical Points. This layout is useful for introducing some of the interesting accessories of the Hornby system. The splendidly-designed "Windsor" Station, for instance, may be placed outside the straight side of one of the ovals, a Brake Rail being substituted for one of the ordinary Straight Rails so as to bring the train to a standstill in the Station when so desired. The Station itself may be made to look very much more realistic by the use of some of the new Miniature Platform Accessories. The general effect of the layout is also greatly improved by the addition of the Footbridge or the Lattice Girder Bridge and the Tunnel.

The pieces required for constructing this layout are:—Large radius—20 Curves (A2), 15 Straights (B1), Double Symmetrical Points, right (DSR2) and Double Symmetrical Points, left (DSL2). Small Radius—8 Curves (A1), 12 Straights (B1), Double Symmetrical Points, right (DSR1) and Double Symmetrical Points, left (DSL1).

(*To be continued*)

A Narrow-Gauge Railway

Railways of all kinds are interesting, but there is something particularly fascinating about narrow gauge lines and their sturdy little locomotives, which haul with the greatest ease loads that appear far too big for them. A noteworthy example of a 15-inch gauge line is the Ravenglass and Eskdale Railway in West Cumberland, which not only carries a steady stream of passengers but also hauls coal, food, and other stores to the villages through which the line passes, besides conveying His Majesty's mails. In short, this infant line is thoroughly capable of earning its own living, and it has attained the dignity of having the times of its trains recorded in "Bradshaw." The story of the line is told in an interesting manner by Mr. Henry Greenly, A.I.Loco E., in a booklet entitled "The Ravenglass and Eskdale Narrow Gauge Railway." This booklet may be had for sevenpence, post free, from the company's office at Ravenglass, Cumberland, and it is well worth the attention of all our readers who are interested in railway matters.

A Miniature Cycle

The miniature cycle appears to have come to stay, and already it has reached great constructional perfection. The "Smithfield Nibs" cycle produced by Messrs. Lintines, of Birmingham, an excellent example of this type of machine, is built on the lines of an ordinary full-sized bicycle, its frame being constructed of heavy gauge weldless steel tubing. The wheels are genuine Westwood, and specially resilient cushion tyres are fitted. The bicycle also has ball-bearing rubber pedals, free wheel, raised handle bars with front pull-up brake, and mudguards. The plating and enamelling are of the best quality and the general appearance of the machine is very smart. Further particulars will be found in our advertisement pages.

For Your Xmas Party

It is often said that "seeing is believing," but we are strongly inclined to doubt the accuracy of this statement after looking through the catalogue of the Midland Magic Co., of 42, Stanley Road, Earlsdon, Coventry. Certainly anyone who masters even a tenth part of the tricks and illusions described in this catalogue will be able to mystify his friends to his heart's content. The tricks range from simple card tricks to a remarkable packet of tea that apparently travels from one paper bag to another and then suddenly transforms itself into an afternoon tea-set! Aspiring magicians would do well to write for this interesting catalogue, which will be sent for 2d. post free to all readers mentioning the "*M.M.*"

How Air Traffic is Controlled—

(*Continued from page* 345)

one indicating a point of the compass. Each light is connected with one of a circle of contact studs beneath a wind vane. At the base of the vertical axis of the wind vane is a contact arm that moves over the studs, each of which occupies the same position in the circle as its corresponding lamp in the lamp circle. Each of the lamps is of a different colour, according to which point of the compass it represents, and the airman can tell, from the colour of the lamp that happens to be lit, which way the wind is blowing.

The aeroplanes themselves have red and green lights on their wing tips, the electric current for the lights and for the wireless apparatus being supplied by a wind-driven dynamo on the machine.

In order that the machines may land safely at night, brilliant searchlights and flares are used to illuminate the ground, and altogether the arrangements made for the safety of the pilots and their passengers are very complete.

H. Atkins (Leatherhead).

Lives of Famous Engineers—

(*Continued from page* 325

only emotion he felt was a strong desire to go to sleep!

Telford's First Bridge

Telford's duties as county surveyor included the building and repairing of bridges, and in this work his early experience at Langholm proved of the greatest value to him. He always maintained that in order to be a thorough judge of work a man must himself have been practically engaged in it, and he often expressed his satisfaction that he had been obliged to begin his career by working with his own hands. The first bridge designed and built under his supervision was a stone bridge across the Severn at Montford, four miles west of Shrewsbury. This consisted of four elliptical arches, one of 58 ft. span and two of 55 ft. each. The work was executed in red sandstone and the bridge proved a very serviceable part of the high road from Shrewsbury into North Wales.

This bridge was completed in 1792, and in the same year Telford prepared the design and superintended the construction of the new Parish Church of St. Mary Magdalen at Bridgenorth. He completed this church to the satisfaction of all concerned, but he felt that his knowledge of the best forms of church and other architecture was insufficient, and he therefore made a journey to London and many of the principal towns of the south and west of England, examining carefully the finest buildings in each.

NEXT MONTH:—

TELFORD AS CANAL-ENGINEER

DRAGLINE CONTEST

A large number of excellent entries have been received, and we hope to announce the result of this contest in our next issue. We shall illustrate some of the winning models.

FROM OUR READERS

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of general interest. These should be written neatly on one side of the paper only, and they may be accompanied by photographs or sketches for use as illustrations. Articles that are published will be paid for at our usual rates. Statements contained in articles submitted for this page are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

Facing the Microphone

A Sheffield Reader's Broadcasting Experience

My sister and I recently had the very interesting experience of broadcasting to the children from the Sheffield relay station. First of all we had tea with the various Aunties and Uncles, after which, just before 5.30, a general move was made to the studio. Here Uncle Herbert and his helpers held a conference, whilst we gazed with awe at an object rather like a large lathe chuck—the Microphone. Suddenly the door opened and Uncle Jim, the engineer, looked in to say that all was ready. These words seemed to charge the atmosphere with electricity, and the tension was not relieved until Uncle Herbert sent out his cheery "Hello, children!" into hundreds of homes. He told his young unseen audience of our visit, and of his intention to let us broadcast.

The various items of the programme were run off smoothly one after another until at last my sister's turn came. She was lifted on to a chair, and there she delivered a recitation which the small studio audience voted to be very good indeed. After Big Ben had sent his chimes booming out into the ether, my turn came. I was fixed in position and sent forth my song, after which it was my turn to be congratulated. For the rest of the evening we listened with delight to the various musical items.

At last, like all good things, the programme came to an end, and it was with rather reluctant steps that my sister and I set out on our mile walk home, where we found that our little performances had been heard on our home wireless receiver.

"MICROPHONE."

"Microphone" and his sister who broadcast from Sheffield recently

A Country Cottage Holiday

We had taken for three months an Anglesey cottage perched on high ground and giving a splendid view of the Menai Straits. In due course the opening day of the holidays arrived, but although it began fairly well, it developed into something that did not in the least resemble the sunshiney railway poster weather.

The journey as far as Bangor was made by train, crossing the Conway Tubular Bridge, and the views of the sea were fine. At Bangor, however, it began to rain. Outside the station we found waiting for us a bus which, to say the least, was peculiar. Its windows had long been broken, and the roof leaked in the middle and a stream of water descended with steady persistence. Notwithstanding the ominous appearance of the bus—I really longed for some Meccano to mend it with—a cheery set of holiday-makers soon filled the watery chariot. Some of the passengers displayed most surprising ingenuity in keeping out the rain, but we were all glad to reach Beaumaris and change into a drier wagonette which took us to Llangoed. The scenery on the way was very nice but distinctly damp-looking, and by the time we had climbed in pouring rain the steep hill that led to our cottage we were past caring whether there was any scenery or not!

The rain passed away, however, and we found the island very beautiful. We greatly enjoyed our daily quarter-mile walk down the hill with empty cans to fetch our water supplies, but the return journey, with full cans which got heavier every minute, did not seem to arouse quite as much enthusiasm!

For three weeks we never saw a railway, and did not want to see one anyhow, and on the whole our cottage holiday was one of the most delightful we have ever spent. WALTER FREEMAN (Bridgend).

How Air Traffic is Controlled

We are all familiar with the white-gloved policemen who stand at the busiest crossings in large towns to control and direct the various streams of traffic in such a manner that confusion is avoided and the danger of collision reduced to the absolute minimum. It is equally important that the air traffic at a great aerodrome such as Croydon should be controlled, otherwise very serious collisions might happen.

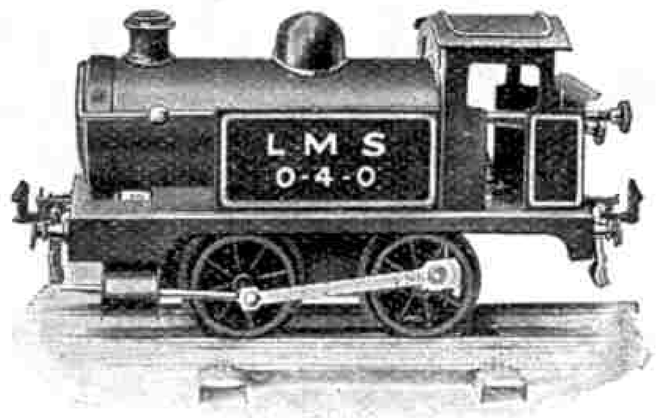
For the most part aircraft are directed by wireless, the wave-length used being 900 metres. The wireless traffic-controller at Croydon has to be a good linguist, for this aerodrome is the junction for the Continental air lines, which include French, German, Belgian and Danish aircraft. The pilots give their positions at intervals by wireless, and these are marked on a map so that the progress of all the air liners flying on the various routes is always accurately known. Incidentally these maps are also used to work out positions of fog-bound machines from the wireless direction-finders.

In-coming and out-going machines are directed in a very interesting manner. The traffic-controller stands on an observation tower consisting of a great white cone of concrete, round the top of which is a ring of flood-lights illuminating the cone and rendering it very conspicuous. The controller uses a powerful hand searchlight of 70,000 candle-power which throws a beam of light so intense and concentrated that it can be seen plainly in full daylight. With it the controller signals in Morse.

In the daytime the direction of the wind is indicated for landing purposes by a curious cone-shaped flag like a butterfly net. At night the wind's direction is indicated in a very ingenious manner. There is a dial of electric lights, each

(*Continued on page* 344)

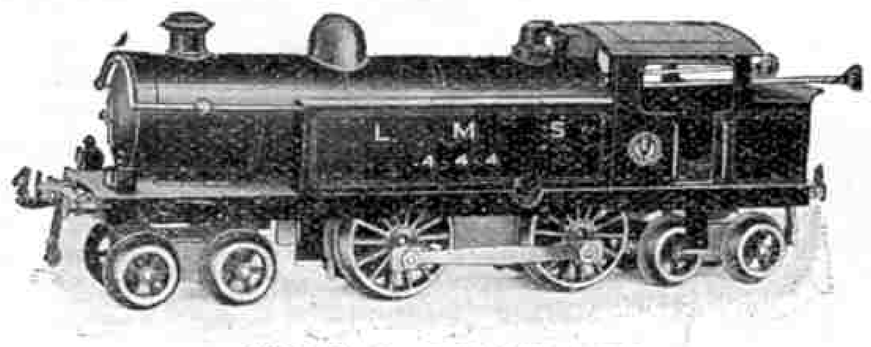
HORNBY TANK LOCOS



HORNBY No. 1 TANK LOCO

Strong and durable loco capable of any amount of hard work; richly enamelled and highly finished; fitted with reversing gear, brake and governor.

Gauge 0, in colours to represent L.M.S. or L.N.E.R. Companies' Locos 12/6



HORNBY No. 2 TANK LOCO

Powerful model embodying all the characteristics of the Hornby series. It is 11½" in length and is fitted at both ends with a four-wheeled bogey. Beautifully finished in colours; lettered L.M.S. or L.N.E.R., with reversing gear, brake and governor. Suitable for 2 ft. radius rails only. Price ... 30/-

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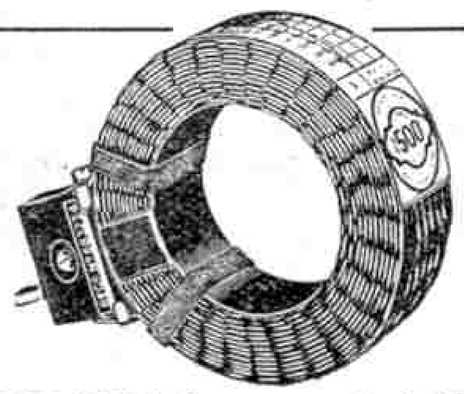
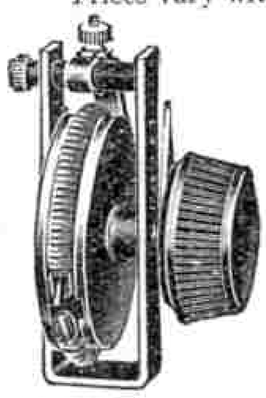


IGRANIC Honeycomb Coil
The qualities of ideal inductance are found to perfection in these Coils—20 sizes to cover wave-length ranges of 100 to 25,000 metres. Prices vary with sizes



IGRANIC Filament Rheostat
A splendid instrument for filament control under all conditions.
Prices: Plain **4/6**; Vernier, **7/-**

RADIO IGRANIC DEVICES

All the care which you devote to the building of your set is so much waste of time *and* of money if you use components which merely serve the purpose but fail to give the results for which you aim. Be guided by the makers who build the finest "made-up" sets the world produces—and build *your* set of the same components which *they* use—you will find they invariably use

RADIO IGRANIC DEVICES

IGRANIC Radio Devices include: Variometers, Vario-couplers, Bi-plug Coilholders, Tri-plug Coilholders, Battery Potentiometers, Vernier Friction Pencils, etc., etc. All carry a six months' guarantee.

They are obtainable of all reputable dealers.

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Newcastle: 90, Pilgrim St.
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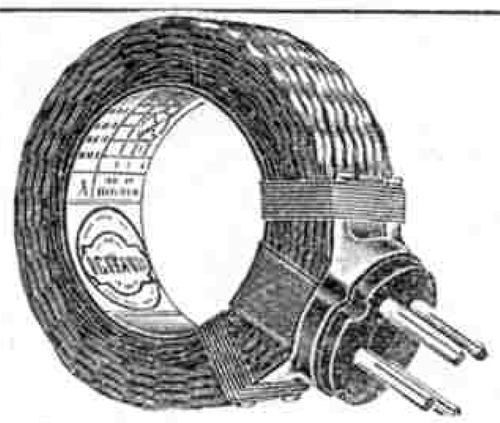


IGRANIC H. F. Transformer
For extremely efficient high-frequency coupling these transformers are ideal. Prices: **8/- 9/6 11/- 12/6**

IGRANIC L. F. Transformer
Noted for distortionless reproduction of speech and music.
Prices: Shrouded, **21/-**; Open, **20/-**

RADIO IGRANIC DEVICES

Competition Corner

THIRD COMPETITION

For Lynx-Eyed Readers

FIRST PRIZE : Hornby No. 2 Pullman Set. SECOND PRIZE : Meccano No. 1 Radio Receiver.

THIRD PRIZE : Pair Meccano Headphones.

CONSOLATION PRIZES : 12 Meccano Writing Pads ;
12 Meccano New Complete Manuals (1924).

SECOND SET*

No. 13	No. 14	No. 15	No. 16	No. 17	No. 18
No. 19	No. 20	No. 21	No. 22	No. 23	No. 24

**It should be clearly understood that competitors will not be required to tear out the pages containing the Puzzle Pictures. The dotted lines are provided for the competitors' convenience only. All entries must be sent on post-cards.*

INSTRUCTIONS FOR COMPETITORS :

This month we publish the second set of Puzzle Pictures in the Third Competition for Lynx-Eyed Readers. Every part illustrated has been taken from a model in the 0–3 Manual (Nos. 23 or 24), and though some of them will certainly be difficult to place, Meccano boys are well known for their perseverance and powers of observation.

As in the last contest of this character, there will be three sets of 12 pictures published, making 36 in all, and competitors are required to attempt all three sets to qualify for a prize. The final set will be published in the Christmas number, when directions for sending in the entries will also be given. *No entries are to be sent in until the last set has appeared.*

A full list of the splendid prizes offered in this contest is given above, and the First Prize will be awarded to the competitor who sends in an entry containing the correct numbers of all the models from which the pictures have been taken. In the event of two or more competitors sending in correct entries, neatness of writing will be considered and the prizes awarded in order of merit. If no competitor succeeds in correctly numbering all the pictures, the prize-winners will be those whose entries are most nearly correct.

New readers may obtain copies of the October "*M.M.*" containing the first set of Puzzle Pictures on application to the Editor, at the price of 3d. each, post free.

New Essay Competition

In connection with the series of articles on "How to Run a Miniature Railway System" that commenced in last month's issue, we are announcing this month a new Essay Competition, the subject being

"HOW I WOULD PLAN A HORNBY RAILWAY."

This Competition offers a splendid opportunity to all readers who are interested in miniature railways. The idea is this. Imagine you have at your disposal the whole range of Hornby Locos, Carriages, Wagons, Rails, Points and Crossings, Bridges, Signals, etc. Then plan the most interesting and railway-like layout you can think of and decide how you would operate it—how many trains you would run, what your signalling arrangements would be, how you would carry out shunting operations, and so on. Having made up your mind on all these points, just write out a clear and straightforward description of your scheme, illustrating it by sketches wherever possible.

The competition will be divided into two sections—(A) for those of 16 and over, and (B) for those under 16, and there will be two prizes in each section. Section (A)—First Prize : Meccano goods to the value of £2 2s. 0d., to be selected by the winner from our catalogue. Second Prize : Meccano goods to the value of £1 1s. 0d. Section (B)—First Prize : Meccano goods to the value of £1 1s. 0d. Second Prize : Meccano goods to the value of 10s. 6d.

Essays must not exceed 1,000 words in length and must be neatly written on one side of the paper only, with the competitor's name, address and age on the back of each sheet. Closing date : 30th November.

There will be an Overseas section of this competition. The closing date is 28th February, 1925, with special prizes, the value of which will be determined by the number of Overseas entries.

Result of Ninth Photographic Contest

Judging by the number of entries in this competition, Meccano boys have been well represented at the Wembley Exhibition. Photographs were received from all parts of the country and many of them were surprisingly successful snaps. Owing to the many high structures and their prevailing white colouring the Exhibition is far from being an ideal subject for the amateur photographer, but the high standard of the entries shows that Meccano boys can be experts in hobbies other than model-building. The Amusement Park was perhaps the most "snapped" part of the Exhibition, and many good photos of "Jack and Jill," the "Safety Racer," the "Switchback" and the "Witching Waves" were received. The Lake and the Palace of Industry were also favourites, a particularly fine night exposure of the former being submitted showing the many fairy lights.

The Competition was divided into two sections—(A) for readers of 14 years of age and under, (B) for readers over 14. In section A the winner of the first prize of Meccano goods to the value of £1 1s. 0d. is H. Tsumura, of Hampstead, London. Pairs of Meccano Double Headphones have been awarded to D. Schofield, of Lincoln and B. Elenor, of York, second and third prize-winners respectively.

The first prize in section B (Meccano goods to the value of £1 1s. 0d.) has been won by E. Muir, of Birkenhead, and the second and third prize-winners are F. Dore, of Northwich, and Derrick H. Webb, of King's Lynn, to whom Meccano Crystal Radio Sets have been despatched.

Result of Wembley Essay Competition

When choosing the subject for the Wembley Essay contest some months ago I endeavoured to forecast which section of the Exhibition would prove the most popular with Meccano boys. Apparently my final choice of the Palace of Engineering was correct, for one reader commenced his description of the Palace with the words "most superb, truly realistic, really magnificent and superlatively exquisite"—all in one sentence! Many other entrants were equally enthusiastic, though perhaps not quite so expressive, and there are certainly many budding authors among readers of the "*M.M.*" The 1,000 word limit gave competitors plenty of scope to describe the exhibits which most appealed to them, and it was a difficult task to decide who was to receive the cheque for one guinea. Frederick W. Morgan, of Calne, Wilts., was finally chosen as the winner of the contest, and we congratulate him on his very clever essay. Four film-pack cameras were also offered as consolation prizes, and these have been awarded to George Rodwell, of Halifax, A. G. Mockford, of Hailsham, M. Kaye, of Morecambe, and Miss Diana Meek, of London, who all submitted splendid essays.

Result of Cycle Essay Contest

Memories of summer days and long light evenings were revived again in reading through the many entries received in our second Cycle Essay Contest. The subject was "My Most Enjoyable Cycle Outing," and every entrant seems to have been blessed with ideal weather throughout his journey, only one competitor admitting that it poured with rain all day!

The best essay received was that submitted by Walter Freeman, of Bridgend, Glamorgan, who described a day's tour with a friend in the Vale of Glamorgan.

The prize offered in this contest was a supply of puncture-sealing solution, to be chosen from an advertiser in the "*M.M.*" The winner has therefore been forwarded a tin of Fibermetic Puncture Seal, and we trust that in future he will be able to continue his country rides undisturbed by such mundane troubles as punctures.

The Meccano Guild

A Fellowship of Meccano Boys

EVERY Meccano boy should be a member of the Meccano Guild, the primary object of which is to bring together Meccano boys all over the world and to help them to get the very best out of life. The Meccano Guild is an organisation for boys, started at the request of boys, and conducted as far as possible by boys. All who have studied its objects must agree that the Guild cannot fail to have a profound effect for good on the lives of its members. By joining the Guild a Meccano boy becomes a member of a great brotherhood of world-wide extent.

HOW THE GUILD COMMENCED

More than a million boys in Great Britain derive their greatest indoor pleasure from Meccano. Before the Guild was formed, hundreds of these Meccano boys wrote to us every week. They told us how they wished they could be put into communication with other Meccano boys and how they longed to be able to meet them. They asked if arrangements could be made so that their wishes might become an accomplished fact.

We responded to their repeated and increasingly numerous appeals, and as a result the Meccano Guild came into being. The Headquarters of the Guild are at the Head Office of the Meccano Works in Liverpool. At the head—guiding and controlling, and taking a personal interest in this great movement—is the President, Mr. Frank Hornby, Inventor of Meccano and Managing Director of Meccano Limited.

BADGE OF MEMBERSHIP

MECCANO CLUBS

Meccano Clubs are founded and established by enthusiastic Meccano boys under the guidance of the Guild Secretary at Headquarters. At the present time there are over 100 active clubs in various towns and villages in this country, as well as many clubs Overseas and in foreign countries. Each club has its Leader, Secretary, Treasurer and other Officials, all of whom, with the exception of the Leader, are boys. If the nearest club to you is too far away for you to join, or if you are unable to join for any other reason, consider the possibility of forming a new club in your own district. A special booklet explaining how a Meccano Club is started and conducted is being published shortly, and this will help you to form your own club. A copy will be sent free as soon as the booklet is ready, and your name will be listed for this purpose if you apply to Headquarters.

OBJECTS OF THE MECCANO GUILD

1. To make every boy's life brighter and happier.
2. To foster clean-mindedness, truthfulness, ambition and initiative in boys.
3. To encourage boys in the pursuit of their studies and hobbies, and especially in the development of their knowledge of mechanical and engineering principles.

SPECIAL MERIT MEDALLION
(About half actual size)

THE GUILD RECRUITING CAMPAIGN

Every Meccano boy should become a member of the Guild and do his utmost to help to make the objects of the Guild widely known. With this end in view, a special medallion (illustrated on this page) is presented to each member of the Guild who obtains three new recruits. As a mark of further merit the medallion is engraved with the name of the recipient and with the words "Special Award" when six more members are recruited. Full particulars of the Recruiting Campaign, together with a supply of application forms, will be sent on request.

AFFILIATION WITH THE GUILD

When a Meccano Club has been successfully launched and good progress is being made, affiliation with the Guild is granted. A beautiful club certificate, suitable for framing and hanging in the club-room, is presented, and the club becomes entitled to such privileges as the loan of interesting lectures and club membership cards. Members are also eligible for the Merit Medallion (illustrated on this page) which is awarded to members who display special ability in connection with club work.

RECRUITING MEDALLION

THE CORRESPONDENCE CLUB

Members of the Guild are able to join the Correspondence Club, by which they are placed in communication with other Guild members in some other part of the country or abroad. To those boys who are interested in foreign languages the Correspondence Club presents a splendid opportunity of obtaining a correspondent in the particular country in the language of which they are interested. They are able to write to a Meccano boy in his native language, and as he would probably reply in English, the correspondence will be of mutual benefit. Stamp collectors also find the Club of value, as they are enabled to exchange stamps with their correspondents. Full particulars and enrolment form will be sent on application.

HOW TO BECOME A MEMBER

Membership of the Guild is open to every boy possessing a Meccano Outfit, or Hornby Train Set, who satisfactorily fills in the prescribed application form. The only conditions are that members promise to observe the objects of the Guild and to wear their badges on all possible occasions.

The price of the Guild membership badge is 7d. (post free) and stamps for this amount should be sent along with the form of application. The Guild badge is beautifully enamelled in blue and white and is made for wearing in the lapel of the coat. Any boy wearing the Guild badge is at once recognised by other Meccano boys as being a member of the Guild and one who has undertaken to live a clean, truthful, and upright life.

In addition to the badge, each member receives a membership certificate, measuring 7″ × 9½″. This certificate is printed in orange and sepia and is a smaller edition of the large club certificate.

Write to the Secretary of the Meccano Guild, Binns Road, Liverpool, asking for an application form and full particulars. Then fill in the form and return it to Headquarters, when you will be enrolled and your badge and certificate will be sent to you. Write to-day, and put M.O. after your name for reference.

THE MECCANO GUILD CERTIFICATE

The Secretary's Notes

Exhibitions and Concerts

By the time these Notes are published a large number of Meccano Clubs will have commenced preparations for their annual Exhibition, Social or Concert. Activities of this character should be included in every club syllabus, for they are the best possible means of making the club well known in the district and of increasing the number of members. The end of the present month, or the first week in December, have always proved the most suitable times of the year for holding these Exhibitions. Members then have sufficient time in which to build their models and arrange side-shows and competitions, while if a concert-party is being formed there is sufficient opportunity for the necessary rehearsals. The date and time of the event, if it is to be open to the general public, should be made known in the district by advertisements in the local newspaper and in Meccano dealers' windows. If club funds permit, the programme should be printed and included in the cost of admission, which should always be kept as low as possible. It is important, too, to remember the question of Entertainment Tax.

Our London Clubs

Since the opening of the First Winter Session, Meccano Clubs in London and the suburbs have been having a very busy time. On a recent evening I was able to meet the Leaders and Secretaries of London Clubs, when we had an enjoyable chat on the prospects and problems of the various clubs. I was greatly impressed by the enthusiasm shown by the London Clubs, and although some of them have decided advantages over clubs in the provinces, they encounter many difficulties that are peculiar to London alone. For instance, in such a large area the members often have to come a considerable distance to the meetings. Then again, London Clubs cannot organise out-door activities because of the difficulty of finding playing fields. There are many other problems, too, with which the Leaders of the London Clubs are faced, but they grapple successfully with their difficulties and the result is an increased enthusiasm for Meccano and club work. At the Leaders' Meeting several interesting suggestions were made, and these I hope to deal with from time to time on this page as opportunity arises. Not the least interesting was one from Mr. Grosvenor, that Esperanto should be introduced into the Correspondence Club. I shall have something further to say on this matter in the near future.

A South African Club's Progress

Meccano Cycling Sections have long proved popular branches of club activities both at home and abroad. One of the first Overseas clubs to form a Cyclists' Section was the Malvern (Johannesburg) Meccano Club of South Africa, whose team of riders is shown in the accompanying photograph. The occasion was the Second Annual Sports held by the club, and a 15-miles cycle race was one of the chief events of the day. In spite of the fact that it rained heavily throughout the race the members put up an excellent performance, the winner completing the course in very good time.

Mr. Sykes, the Club Leader, believes that public displays and meetings of this character are of the greatest value to Meccano clubs in making their existence more widely known and in securing new members. This has certainly been the case with the Malvern Club, which, started in January 1920 and affiliated in December 1921, now has an active membership of 34, while numerous new applications have been made since the opening of the present session. We congratulate our South African friends on the progress of their well-established club and also on the very creditable performance of their cyclist members.

Exhibitions Past and Future

Last month the Sixth Annual Exhibition of the Holy Trinity Club was held at Islington and lasted for two days. This proved a great success, and the striking display of models and Hornby trains attracted a large number of Guild members. Then the St. Mary's Club, the world's largest Meccano Club, are holding their Exhibition on the 19th of this month, and a good display is assured. While in London I took the opportunity of looking-in at St. Mary's, and on club night found the club hard at work preparing for their Exhibition. The club is fortunate in having splendid accommodation and a recently-commenced Fretwork Section, although at present only small, has some very enthusiastic members. The section shows great promise, especially in the making of saleable articles for Exhibitions and the like. This is a point that might well be considered by other clubs, for club funds often may be augmented by the sale of fretwork novelties—a scheme not practicable, of course, in Meccano model-building!

For Overseas Readers

I often receive letters from Meccano boys in the Colonies and in foreign countries who wish to join the Guild, but do not know how to send the necessary remittance for their badge. They usually think that foreign or Colonial stamps are of no value in England, but this is not the case, and remittance may always be made by postage stamps or money orders. Meccano boys in South Africa, Australia and New Zealand wishing to join the Guild should apply to the Meccano agents in those countries for an application form and full particulars. The form should then be filled in and posted to these Headquarters in Liverpool with the necessary remittance. In Canada badges and forms may be obtained direct from our Canadian office. The full names and addresses of these agencies are given in column 3 on page 368. Readers in India and foreign countries should write for information and forms direct to the Guild Secretary, Binns Road, Liverpool, England.

Price of Badge Abroad

It has now been decided that in future members abroad will be required to pay postage on their badges. The price of the badge remains at 7d. as hitherto, to which must be added 5d. for registered postage, making 1/– in all. Orders for badges received at Headquarters before the 31st December will be executed at 7d. (post free) as before.

London Guild Exhibition

An Exhibition by the St. Mary's (Newington Butts) Meccano Club has been arranged for Wednesday, 19th November. It will be held at St. Mary's Schools, Newington Butts, London, S.E.11, commencing at 7.30 p.m. Admission will be by ticket, which may be obtained (free of charge), together with full particulars, from the Leader, Mr. G. Treves, 207, Newington Butts, S.E.11, or from the Secretary, Mr. C. A. E. Curle, 37, Pullen's Flats, Peacock Street, S.E.11. We hope that all Meccano boys in London will take this opportunity of visiting the world's largest Meccano Club where they will be assured of a cordial welcome.

CLUB NOTES

Blackpool M.C.—The first meeting was held at the end of September, when the various club officers were elected by vote. A new rule by which all club members must be enrolled in the Meccano Guild was also introduced, approved and passed by the Committee. The club programme for the present session includes papers by a number of members, model-building evenings and a lecture on the Isle of Man by the Club Leader. Club roll: 24. *Secretary*: Master J. Fraser, 10, Clifton Street, Watson's Lane, South Shore, Blackpool, Lancs.

Luton M.C.—Activities are now in full swing and it is proposed to organise a Cycling Club and Football Team in the near future. An interesting syllabus has been arranged and wireless evenings will be one of the features of the session, which closes on 17th December with a social evening. Club roll: 26. *Secretary*: Master L. Goldsmith, 69, Tennyson Road, Luton, Beds.

Barnetby (St. Barnabas) M.C.—Owing to the departure of Mr. Percival for Africa, Mr. Watson has kindly agreed to accept the position of Club Leader. The present session recently commenced with an enjoyable social. Woodwork and Botany have been included in the programme, and preparations are now being made for a Grand Exhibition to be held at Christmas time. This exhibition, the Secretary modestly states, will be "something like Wembley!" Club roll: 29. *Secretary*: Master R. H. Ward, Laurel Villas, Victoria Road, Barnetby, Lincs.

Victoria (Glasgow) M.C.—Recommenced activities in the middle of September last and the attendance and general enthusiasm of members indicate another successful session. Unfortunately, Master Ian Kerr, the popular Club Secretary, has had to resign his duties on account of school work, but will nevertheless attend club meetings as often as possible. Model-building, lectures and debates figure in the club programme, and a social or exhibition may possibly be held towards the end of the year. Club roll: 47. *Secretary*: Master Thomas Calderwood, 63, George Street, Whiteinch, Glasgow.

Boston Model-Making M.C.—The club is now settled in its new hall, which is a great improvement on the old meeting-place. A Whist Drive and Dance was held on the 14th of last month and a report of this will be published later. It is hoped to instal a three-valve wireless set in the near future, as all the members are keenly interested in radio. Engineering lectures illustrated by cinematograph films and speed competitions in Meccano model-building will be held during the course of the session, and it is intended to make the club "one of the very best going." Club roll: 30. *Secretary*: Master R. Robinson, 30, Woodville Road, Boston, Lincs.

Redruth M.C.—Has held meetings throughout the summer months and commenced the new session early last month. It is proposed to have Model Building, Meccano Competitions and Lectures on alternative evenings, and an Exhibition is being planned for Christmas. Members are keen on securing Recruiting Medallions, and several new recruits to the club are expected very shortly. Club roll: 36. *Secretary*: Master L. Trenberth, Tunnel Stores, Redruth, Cornwall.

St. Mary's (Newington Butts) M.C.—There was a very good attendance at the re-opening of the club in September and several new members joined the Fretwork Section. Two club nights are held each week owing to the large membership, and several novel competitions have been arranged for the present session. These include the building of "Models of Engineering Apparatus seen at Wembley"; "Articles in connection with current club lectures"; "Inventors' Competitions" in which members are to construct original models, prizes being awarded for the best efforts; "Models from the Meccano Manual built from memory"; and "Improvements on Manual models." At present the club is busily engaged in making preparations for its coming exhibition, full particulars of which appear on page 349. Club roll: 103. *Secretary*: Mr. C. Curle, 37, Pullen's Buildings, Peacock Street, London, S.E.11.

South Africa

Simonstown Meccano and Wireless Club.—Meetings are now held fortnightly and many new recruits continue to join on club nights. The club Wireless room will shortly be finished and members are keenly anticipating the event. The programme arranged for the next three months features lectures on "Mining," "Diving" and "Locomotives," which will be given by local gentlemen, and outings to neighbouring places of interest have also been arranged. Club roll: 24. *Secretary*: Mr. B. G. Randall, Municipal Office, Simonstown, S. Africa.

Malvern M.C.—The report for the past session shows a membership of 31, with an average attendance of 85%. The club has been divided into three sections:—Ramblers, Rovers, and Rangers. Marks are given for club work, etc., and the section holding the highest number of marks holds the Club Shield for the session. An Honorary Members' Club for boys who cannot attend on club nights is proving very successful. Honorary members pay half subscription fees and are allowed to take part in any sports, etc., of the club. A 15-mile cycle race was held recently and provided an exciting finish. Club roll: 31. *Secretary*: Master C. Gunnell, 177, St. Frusquin Street, Malvern, Johannesburg, South Africa.

India

Calcutta M.C.—The Club Leader, who was recently indisposed, is now fit again and directing club activities. These include model-building contests and preparations for a Variety Entertainment to be held at Christmas. The funds obtained will be devoted to the purchase of a wireless set for club use. The club-room has recently been decorated with Meccano posters and streamers and now presents a very cheerful and attractive appearance. Club roll: 32. *Secretary*: Master A. N. Roy Chowdhry, 35, Beadon Street, Calcutta, India.

Australia

Footscray M.C.—One evening each month is devoted to business discussions and the arrangement of the following month's programme. A recent important occasion was the opening of a Club Bank account with a first deposit of £2 15s. 0d. A games night is held every quarter when members play for the club championship in draughts, chess and cards, and this is an exceedingly popular event. Wireless is a recent addition to club activities and new circuits and apparatus are tested on radio evenings. Members recently succeeded in exchanging signals over a quarter of a mile distance and further experiments are being made. A club banquet was held at the close of the last session, when Mr. Harry Roach, the energetic Club Secretary, and his brother tendered their resignations on account of their pending departure from the district. Mr. Roach's valuable services will be greatly missed by the club and all members wished the two brothers every success in the future. *Secretary*: Master Richard Hartwell, Leeds Street, Footscray, Victoria, Australia.

Clubs not yet Affiliated

Windsor M.C.—A gentleman has now kindly offered to take over the Leadership, and Club Sports held recently were greatly enjoyed. Present membership: 12. Guild members wishing to join should communicate with the *Secretary*: Master K. Greenwood, 83, Victor Road, Windsor.

Rosyth M.C.—Will very shortly be affiliated with the Guild, as good progress continues to be made. Members recently enjoyed an outing to Aberdour, a seaside resort some few miles distant. The Winter Session is now in full swing, and Meccano boys near Rosyth are invited to obtain full particulars of the club from the *Secretary*: Master Edward Hunter, 79, Admiralty Road, Rosyth, Scotland

Keynsham M.C.—Has now succeeded in finding a club-room owing to the kindness of a local gentleman in offering the use of a room in his house. Several enjoyable meetings have already been held and members are keen on model-building and fretwork. Recent lectures by the Club Leader included talks on "How an Aeroplane is Made" and "The Working of a Motor-cycle Engine." Application for affiliation with the Guild will be made very shortly as there is every indication of a successful club being established. Club roll: 12. *Leader*: Mr. R. Lea, 2, The Avenue, Keynsham, Somerset.

Children's (Delhi) M.C.—Many new members have recently joined, both adults and children, and club nights are invariably well attended. A well-printed and edited club magazine, "*The Children's News*" is published monthly and has a considerable circulation outside the club circle. The new session recently commenced and model-building, lectures, outdoor games and scouting comprise the chief activities of the club. *Secretary*: Master R. Raman, Children's Meccano Club, Charkhe Walan, Delhi, India.

Proposed Clubs

Dulwich M.C.—Master Henry Briant, of 140, Dunstan Road, East Dulwich, London, S.E.22, is endeavouring to form a club, and would be very pleased to hear from any Meccano boy who would like to join. An adult Club Leader and a suitable club-room are also needed.

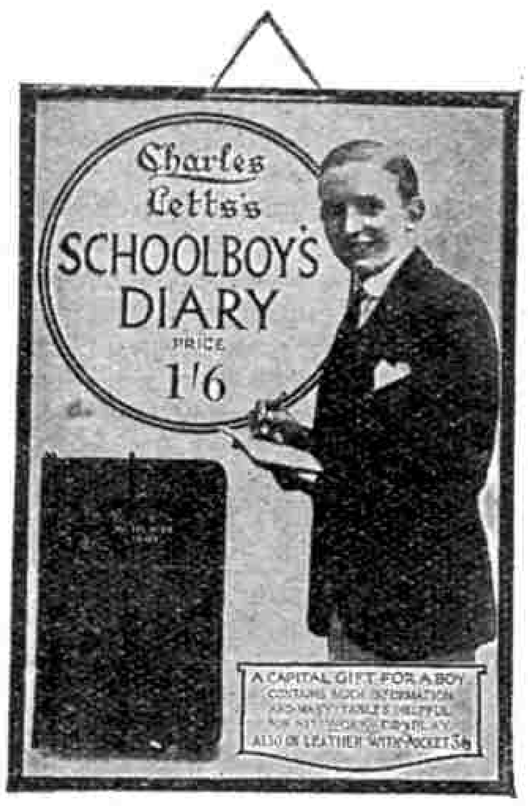
Liverpool M.C.—Efforts are being made to found a club in Liverpool, and those boys interested are asked to write to-day to Master G. Alexander, of 14, Falkner Street, Liverpool. There is every possibility of this club succeeding if Meccano boys in Liverpool will co-operate and arrange a meeting.

Sheffield M.C.—It is hoped to shortly establish a Meccano Club in this city, and the search for a Club Leader and room are occupying the attention of the organisers. New members should get into touch with Master A. Pether, 116, Hill Street, Sheffield.

The Ideal Present

Charles Letts's

SCHOOLBOY'S DIARY for 1925



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How to Run a Meccano Club

by the

Guild Secretary

(Continued)

Club Leaders should be on their guard against allowing the winter programme of their club to become too serious and strenuous. For instance, it is not wise to arrange the programme for each club night so that the whole time is fully occupied with work. It is far better to aim at finishing work a little while before the time for closing, devoting the remaining period to some kind of game. It does not matter very much what the game is, so long as it is a good one and played in the right spirit, and the effect will be to make every member of the club leave in a thoroughly good humour as the result of a few minutes of light-hearted fun.

Football Clubs

Another important point is the establishment of a Football Club. Provided a Meccano Club has sufficient members there should be little difficulty about this, as most boys are naturally keen on the game. The only trouble that is likely to arise is in regard to arranging sufficient matches. Probably the best way of dealing with this problem is to insert a small advertisement in the local paper, stating the strength of the club and inviting fixtures with other local clubs. The Secretary of the local Y.M.C.A. also can be of great service, and as a rule he is not only able but willing to put a Meccano Football Club in communication with other clubs.

It has been suggested on several occasions that a Meccano Football League should be instituted and a Challenge Cup offered to the winning team. While this suggestion is one that we hope to be able to adopt at some time in the future, there are several difficulties in the way at present, chief of these being the question of distance. In the majority of cases the Meccano Clubs are so far apart that the journey for the visiting team would be far too long and expensive an undertaking. As new clubs are being formed almost every month, however, this obstacle will eventually be overcome, and then it will be possible to establish a Meccano Football League. In the meantime every opportunity should be taken of arranging inter-club matches in districts where there are several clubs within easy distance of one another.

Club Funds

This is an all-important question that requires serious consideration, and it is regrettable that it has been the cause of the breaking-up of several clubs, entirely as the result of bad financial management. The Club Leader should be asked to act as treasurer, and in this capacity to take complete control of the expenditure. Members' weekly subscriptions may prove insufficient to pay expenses, but it is sincerely hoped that clubs will not resort to charity. Without exception, Meccano Clubs—when well managed—have always paid their way very handsomely. In addition to providing for their own needs they have often helped with great success at bazaars and sales of work in aid of the funds of some religious or charitable organisation. A club can earn quite a respectable income if all its members pull together and are under the guidance of a keen and reliable Leader.

It has been proved many times that a good Concert or Exhibition, provided it is well organised, will produce ample club funds. First of all experience should be gained through one or two small Concerts, and then a more ambitious Concert and Demonstration may be organised. In large towns it is frequently a good thing for two or more clubs to take part in a combined Concert, and in this case the funds raised must be divided equally among the clubs concerned. Concerts are generally most successful if they are held during the winter months.

Small Concerts or Exhibitions may be held in the club-room, parents and friends being invited to attend. If thought desirable, a small charge for admission may be made for the benefit of the club funds. Prizes may be awarded for the best models and, if possible, the results should be announced in the local papers. Additional funds may be raised by running various side-shows, such as different kinds of Building Competitions, Guessing Competitions, Automatic Working Models and the ever-popular Meccanograph design-making.

Concerts at Ends of Sessions

A combined effort should be made by club officials and members to promote a successful Concert on as large a scale as possible at the end of each winter session, and the Club Leader can give very valuable advice in the selection of the items and in organising the event generally and making it run smoothly. It is of the greatest importance, however, to ensure that the programme is entirely composed of really good items. If possible, a larger room than the ordinary club-room should be obtained for such a Concert, and the event should be sufficiently advertised in the local papers.

Often a local shopkeeper is very glad to have exhibition models loaned to him or built specially for display in his windows, and in return for this assistance he may offer to present a prize for some club competition. Boys undoubtedly appreciate and are encouraged by the display of their efforts in this way.

Encouraging Visitors

Both Exhibitions and Concerts serve the valuable purpose of gaining the interest of parents and friends in the doings of the club. Visitors to the club should be encouraged, for they will quickly realise that the boys are worthily occupied and that influences are at work which must bring out the best in a boy's nature and exert a beneficial effect on his character. Visitors learn to approve of the objects of the Meccano Guild, and by encouraging the boys to more active participation in Guild work they help to ensure the success of the Club Leader's efforts. For these reasons it is very desirable that the work and aims of the club should be brought under outside observation as much as possible.

Guild Correspondence Club

All members of the Meccano Guild belong to a world-wide brotherhood of boys, all thinking the same kind of thoughts, sharing the same pleasures and thrilled by the same ambitions. They all naturally want to know what kind of lives other boys live, and they are anxious to tell other boys about their own schemes and ambitions and all the things in which they delight. To meet this recognised need the Guild Correspondence Club was started in September 1920 and since then it has prospered exceedingly. Many hundreds of friendships have sprung up all over the world as the result of the Correspondence Club's activities, and these are friendships of the type that endures, for they are based on a common interest. Correspondents are found in any country abroad and the correspondence may be in English or in a foreign language as desired. There is no charge at all for entrance into the Correspondence Club, and Guild members who are interested should write to the Guild Secretary asking for full particulars and a form of application.

(To be continued)

Meccano Club Leaders

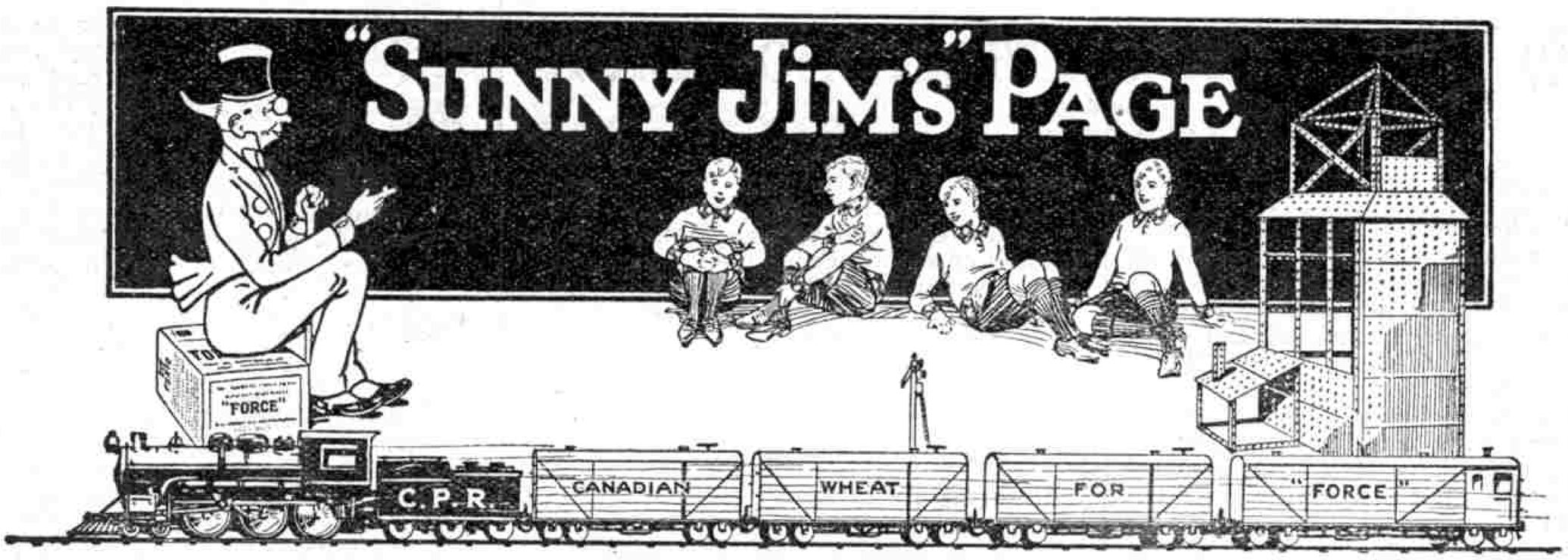
No. 17. Mr. G. TREVES

As Leader of the largest Meccano Club in the world, it must afford Mr. Treves considerable interest to look back on the early days of the St. Mary's (Newington Butts) Meccano Club. In December 1920 he first became interested in the formation of a club, and it is typical of his ability and energy that two months later the club was affiliated with the Guild, its title at that time being the St. Mary-with-St. Gabriel Meccano Club. The membership in April 1921 was 47, and since then the club has continued to grow and prosper.

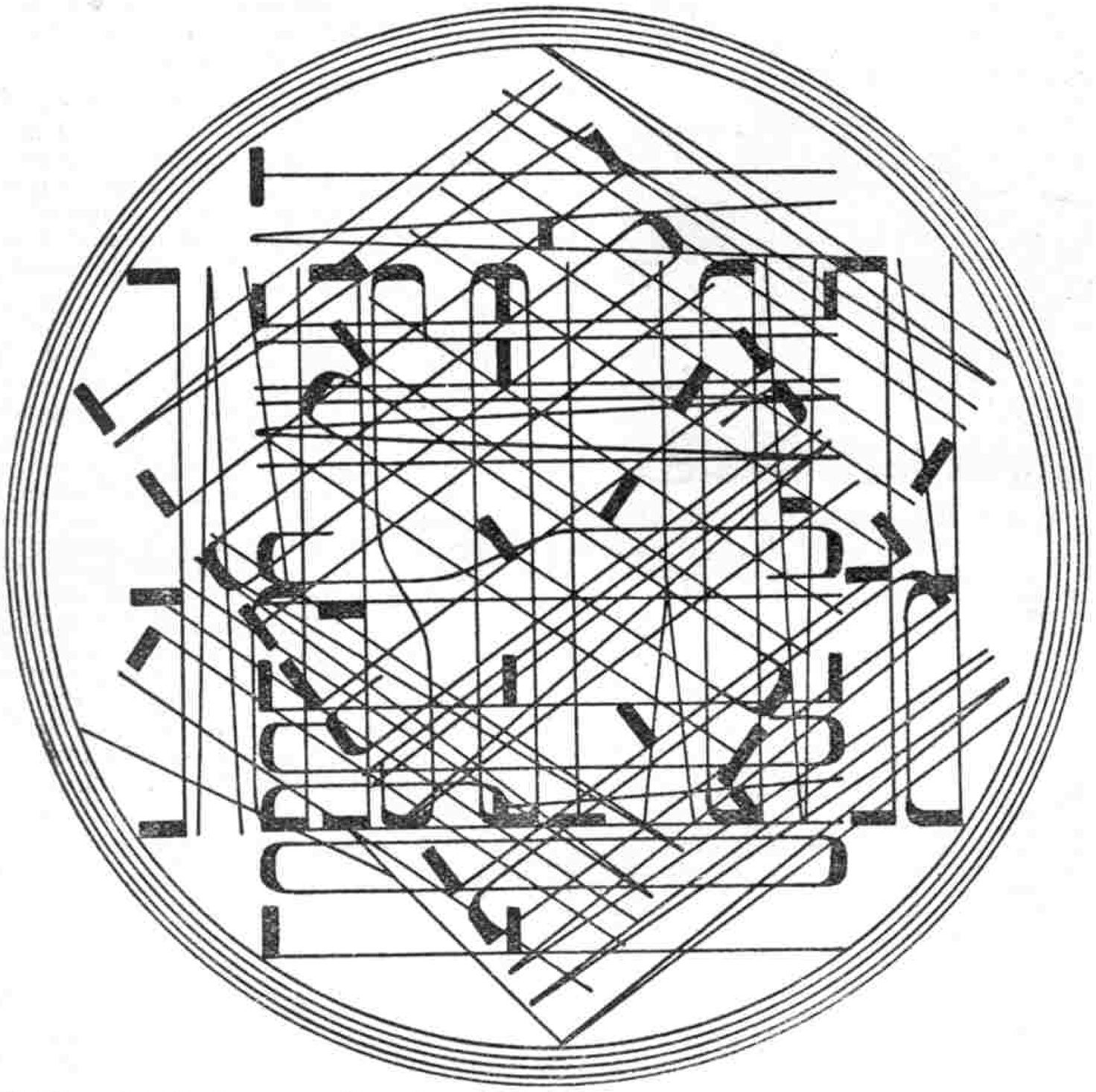
In July 1923 it was decided to alter the club's name to the St. Mary's (Newington Butts) Meccano Club, and owing to the steadily-increasing membership, Photographic, Fretwork and Radio sections were organised. In May of this year, with a roll of 103 members, the club became the largest in the world, and has successfully kept this position up to the present, though closely followed by a leading South African Club. The club has always taken a prominent part in Guild activities in London, has assisted in four very successful Annual Exhibitions and was also well represented at recent Guild Rallies.

A club magazine, "*The St. Mary's Meccano Monthly*," was started in March 1922 and was at first duplicated, but is now excellently printed and edited by Mr. Treves.

The record of the St. Mary's (Newington Butts) M.C. which, starting with only nine members, is now the premier Guild Club, presents a striking example of what can be accomplished by unflagging enthusiasm allied with genuine ability. Guild members the world over will join Headquarters in heartily congratulating Mr. Treves on a very fine achievement and in wishing him every success in the future.



CAN YOU SOLVE THIS?



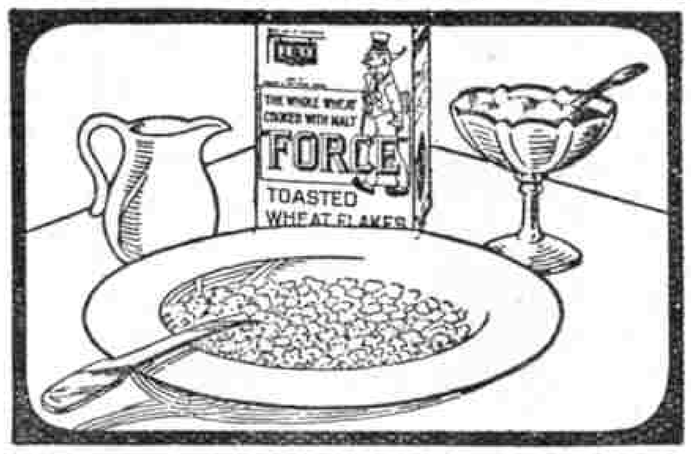
Here's a puzzle for you. There's quite a lot of interesting news inside that circle. It's easy to read once you know how. Turn the page about any way you like and look at it from any position you like. When you have deciphered the message write it on the back of a post-card and send it to me. I'll send you in exchange a generous sample packet of "FORCE," the famous malted and toasted wheat-flake food, together with a beautifully coloured nine-page recipe booklet and calendar, so made that it can be hung on the wall for reference.

This booklet shows how you can have "FORCE" every day of the week, yet never on two days alike. You will be able to choose the kind of breakfast you like best and then ask for it to be served for you—nobody will mind your choosing your own breakfast this way, because "FORCE" is served in an instant without any trouble at all.

Your friends will like to join in this hunt for the hidden message. Let them have a try! I will send to all who send me solutions parcels similar to that which I have promised you. They have only to write their solutions on post-cards and send them to me with their names and addresses. See how many of your friends can solve the puzzle!

"FORCE" BUILDS BRAINS AS WELL AS MUSCLES

When at school have there ever been times when you have found it difficult to concentrate on the lesson, in spite of your desire not to be inattentive? You will



most likely have to answer "yes" to that question.

WHY?

It is not because you are lazy. Many a boy has been wrongly accused of being lazy when the real trouble is in his digestive apparatus. What has that to do with mind wandering or "wool gathering" as some people call it?

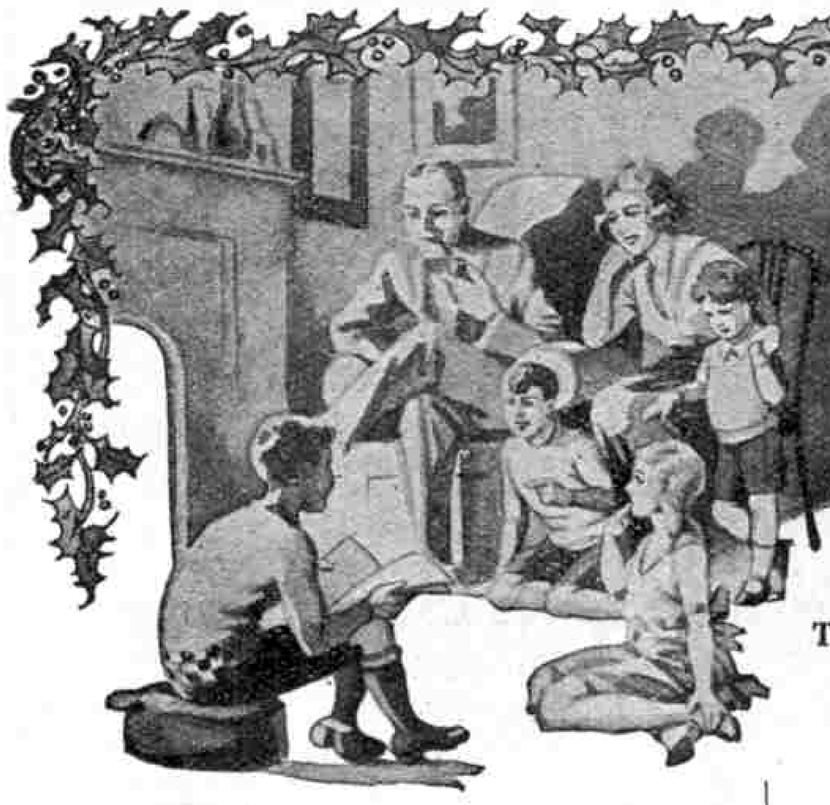
It has this to do with it :—

Brainwork demands a rich supply of blood in the brain. Digestion demands a rich supply of blood in the stomach. Hard digestion takes some of the blood that should be helping you to think. "FORCE" eliminates hard digestion because "FORCE" is wonderfully easy to digest yet it supplies the maximum amount of nourishment. "FORCE" does even more than give you unrestricted power to concentrate on your work, it enriches the blood because it is whole wheat.

That is another and important reason why you should include "FORCE" in your daily diet. Mother can buy "FORCE" from the grocer's at 9½d. a packet. A packet contains many nourishing and delicious meals. All there is to do is to add hot milk, or fruit, and you have a plate of the most tempting food imaginable. Start to-day and eat "FORCE" regularly.

Sunny Jim

Dept. Mc.3, 197, Gt. Portland St., London, W.1.



Fireside Fun

JUDGING from my correspondence, "missing word" puzzles are very popular with my readers, and the puzzle published last month, dealing with names of Meccano parts, has aroused general interest. This puzzle is undoubtedly a difficult one and the many readers who have tried their hands at solving it will be interested to see the correct solution given elsewhere on this page.

A very ingenious puzzle of this kind is sent in by Louis L. King, of Shillelagh, Co. Wicklow, Ireland, to whom 2/6 has been sent. The problem is to fill in the various blanks in the following little story with names of well-known motor cars. The number of asterisks denotes the number of letters in each missing word :—

Puzzle No. 37.

Tom and I had a little argument and he spoke quite ******** to me. The trouble began about a man called ******. ****** was written all over him, and although he had been a bit of a ***** he was not a bad sort. He was a good ****** and even if he were not a **** his ******** was high. Tom, however, did not like him. One evening while Tom was on holiday in ***** he was crossing a stream at the **** when he met this man. Tom was not ***** enough to ***** him, and he had to stay and chat for a while. The only thing that made him feel resigned was the weather, for scarcely had the last ******** departed when the **** rose, and occasionally a ****** flashed.

* * * *

Puzzle No. 38.

The name of a beast, a bird, a reptile or an insect is hidden in each of the following sentences. The letters forming the name run consecutively in the correct order :—

(a) This system upsets everything.
(b) The big nuts are not always the best.
(c) I went to the hotel and booked a room,
(d) He fell with a crash against the wall.
(e) A switch below the overmantel operated the mechanism.
(f) Strong national feeling was aroused.
(g) His prestige rose greatly through this action.
(h) There is always an almanac on David's desk.
(k) I said to the keeper : "Is that bear mad, ill or angry ?"

* * * *

A visitor being shown through the Law Courts said to his friend : "My word ! the judge has a tough crowd to deal with this morning."

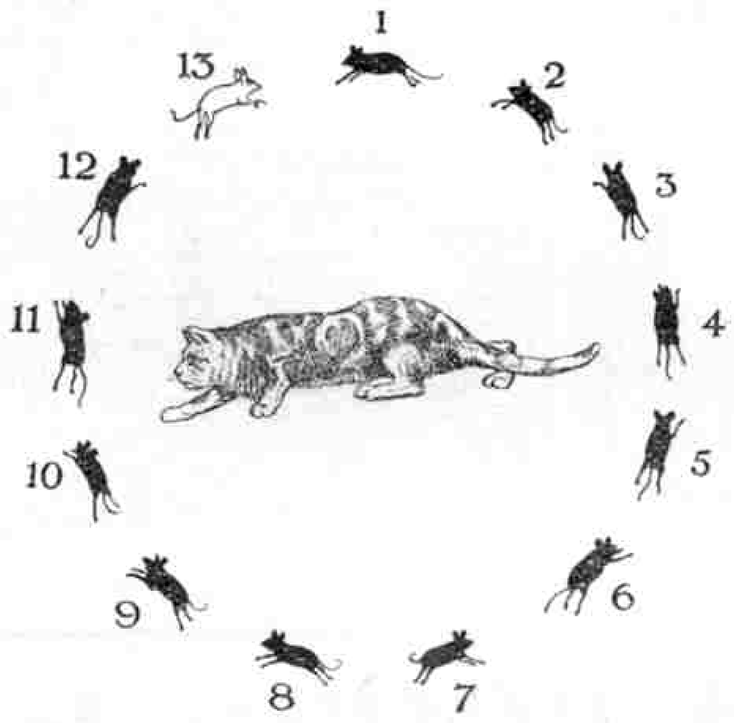
"Sh–h–h !" said the friend, "those are the solicitors !"

This Month's Short Story

Little boy—
Pair skates.
Broken ice—
Heaven's Gates.

* * * *

Puzzle No. 39.



The above diagram shows a cat with thirteen mice (twelve of which are black and the thirteenth white) arranged in circular order around her. She kills them one by one, starting to count at a certain mouse and counting to the thirteenth mouse each time. She kills the thirteenth and proceeds each time to count from the next living one, and the puzzle is to find from which mouse she must start to count in order that she may kill the white mouse last.

(Contributed by James McManus, Bridge-End, Derry, to whom the monthly prize of 5/- has been awarded).

* * * *

Puzzle No. 40.

Arrange the following letters so as to form four words :—

An R and an N and W, U, A,
You mix with four T's in the right sort of way ;
Three S's, two O's and two H's and E's,
The answer encompasses all land and seas.

* * * *

Q. Why is an emaciated man like an extracted tooth ?

A. One is tooth-in and the other tooth-out.

* * * *

Q. Mrs. Biggar had a baby. Which was the bigger, Mrs. Biggar or the baby ?
A. The baby, because it was a little Biggar !
Q. Which was the bigger, Mr. Biggar or the baby ?
A. Mr. Biggar was father Biggar !
Q. Mr. Biggar died ; was the baby then bigger than Mrs. Biggar ?
A. No, for the baby was fatherless.

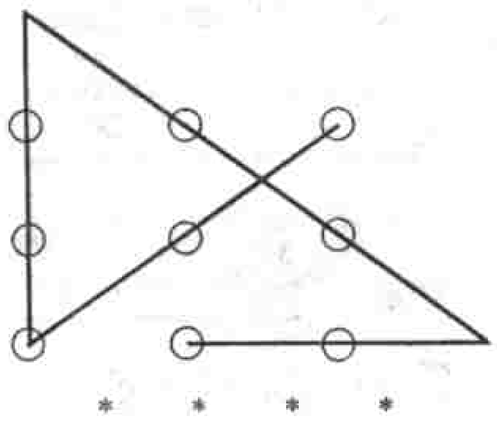
Answers to Last Month's Puzzles

No. 34. Missing names of Meccano parts :—

Dick was only a *STRIP* of a lad, and he thought his *BOSS* was an *ECCENTRIC* old *CRANK*. Dick's wage scarcely enabled him to buy sufficient *GRUB*, let alone his favourite *NUTS*. Even a *WORM* will turn, however, and presently Dick became convinced that he could *SCREW* out of the old *BUFFER* an increase in wage. Without any beating about the *BUSH*, he *SET* his *TEETH* and *BRACED* himself for the attempt. He took no chances, however. There was some risk that his employer would *COLLAR* and *PINION* him, and therefore Dick held himself ready to *PIVOT* round on his *PINS*, *SPRING* through the door and *BOLT* for his life.

No. 35.

The rings are joined as shown below :



* * * *

No. 36.

With the metal paper-weight the grocer weighed two lots of tea—total weight 13 ozs. Then he placed in the scoop of his scales half-a-pint of distilled water, weight 10 ozs., and took 3 ozs. from the 13 ozs. of tea already weighed. He laid these aside and emptied the 10 ozs. of water out of the scales and then weighed a further 3 ozs. with the 3 ozs. he had previously laid by. These three lots of tea combined formed exactly 16 ozs., i.e., the 1 lb. of tea for which the customer had asked.

HELP !

"What's all that noise gwine on ovah at you' house last night ?" asked an old coloured woman of another. "Sounded like a lot of catamounts done broke loose."

"Dat ? Why dat was nothin' only de gen'man from the furniture store collecting his easy payments."

* * * *

Q. What seven letters did Old Mother Hubbard use when she looked into the cupboard.

A. OICURMT

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We are also agents for Raleigh All-Steel. Prices from £7 12 6. Humber: Prices from £6 17 6. Write for particulars of our EASY TERMS.

Arundel Cycle & Sports Stores

58, Church Rd., Upper Norwood, S.E.19.

'Phone Syd. 2482.

NO PUNCTURE TUBE

Fit Fibermetic-treated tubes on your bicycle and you will never be let down on the road by punctures. Instantly stops all air leaks up to 1/8th inch. Entirely non-injurious to rubber, does not choke up valves.

Best quality cycle inner tube treated with Fibermetic Instant - Puncture Stop sent (post free) for **4/-**

You can treat your own tubes for **3/6** per pair. Fibermetic—the Permanent Puncture Seal—is sold in tins, 1 lb. **3/6**, 2 lb. **7/-**

New Inner Tube sent if claims not fulfilled.

Trade Enquiries Invited.

***The* FIBRINE SALES LTD.,**

19, Villiers Street, Strand, London, W.C.2.

WORLD'S BEST CYCLE.

GRAVES

The highest point of **All British** engineering excellence. Warranted 10 yrs.

HANS RENOLD CHAIN; CLINCHER A-WON TYRES; DUNLOP WESTWOOD RIMS; BOWDEN BRAKES; B.S.A. FREE WHEEL; BRAMPTON'S HUBS; REYNOLD'S STEEL TUBES; WILLIAMS' CHAIN WHEEL; SPIRAL SPRING SADDLE. PRICE £7 : 10 : 0 (Ladies' Model same price)

Delivered carriage paid to approved orders for **10/-** with order. Balance **10/-** monthly if satisfied. Money back in full if disappointed

CATALOGUE Post Free

Complete range of Models

J. G. Graves Ltd. Sheffield.

10/- NOW

BIG FREE BARGAINS BOOK

128 pages. Profusely illustrated. Absolutely Free. Bargains for everybody—Home Wants, Personal Needs, Toys for Children. Everything direct from factories at HALF usual prices. Lever Watches, 3/3; Clocks, 1/9; Penknives, 6d.; Safety Razors, 5½d.; Air Guns, 3/11; **Gramophones, Wireless and Sewing Machines on Easy Payments.** Sensational offers in Cutlery, Household Utensils and Tools. Don't delay. Get the Book TO-DAY.

MOORHOUSE LTD. (Room 43),

PADIHAM, BURNLEY.

No More Punctures

Stop tinkering with tyre levers, messy solutions and patches. Send a P.C. for this booklet which tells how to end puncture mending for ever. It's

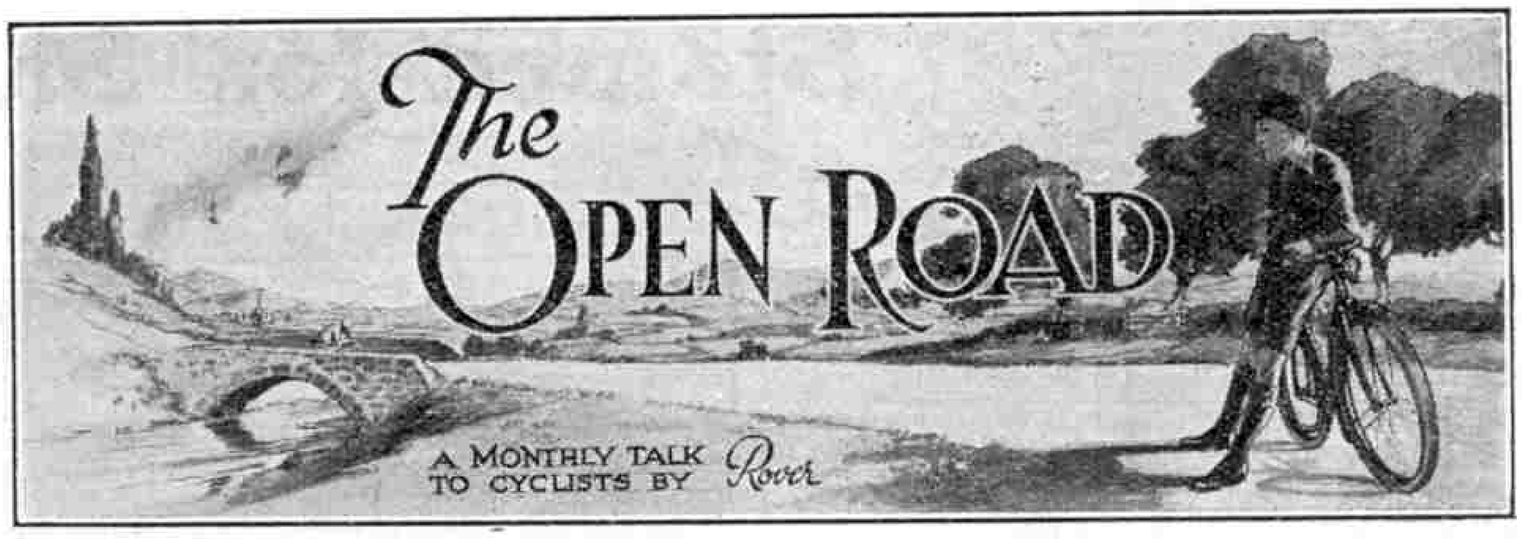
Free

to Meccano Readers.

Address:

JACKSON'S IMPERVO SALES LTD.,

(Dept.31a) 48, Dover St.,LONDON,W.1



IX. CYCLE LAMPS

THE present dark nights have once more revived the old question among cyclists as to which is the most satisfactory type of light for night riding. Each type possesses certain advantages which every cyclist should study before making a definite choice, as he is then able to judge which will best suit his particular requirements. For purposes of comparison, bicycle lamps may be classed under three headings, Electric, Oil and Acetylene, and of these the oil lamp is by far the most popular.

Oil Lamps and Their Defects

These old cycling friends, which succeeded the early candle lamps, have many points of recommendation, for they have a long burning capacity, the fuel is not expensive, and when carefully looked after they give a very efficient light. The principle on which they work is simple, and yet because it is not properly understood many users are unable to trace and rectify common troubles.

In every type of oil lamp the cotton wick, which should always be of correct width, is suspended in a reservoir of oil and the oil is drawn up the wick by capillary attraction. The series of small holes in the top of the lamp provide an outlet for the fumes, and fresh oxygen is taken in from the perforations in the base of the lamp. In time these ventilation holes may become clogged with mud or dirt and the imprisoned gases prevent the ingress of oxygen. The flame of the lamp then quickly becomes "unhealthy," and the slightest jolt of the machine or gust of wind will at once extinguish it.

Other causes of lamp failure may be the use of an unsuitable oil or a clogged wick. Lubricating oil cannot be used for lamps. Instead, special burning oil of good quality should be used. The wick should be changed reasonably often to prevent the capillary passages becoming choked with the consequent "charring" of the wick.

Electric Lights

A variety of electric cycle lamps are now made but the majority are only variations of two distinct types, in which the current is either generated as you ride or stored in a battery.

The great advantage of electric battery lamps is that they are very clean to use and may be switched on at any moment without the necessity of dismounting and — perhaps — striking innumerable matches. The electric battery, which is similar to that used in a flashlight battery, may be either carried behind the lamp itself or attached to the cycle frame and connected to the bulb by a length of flex.

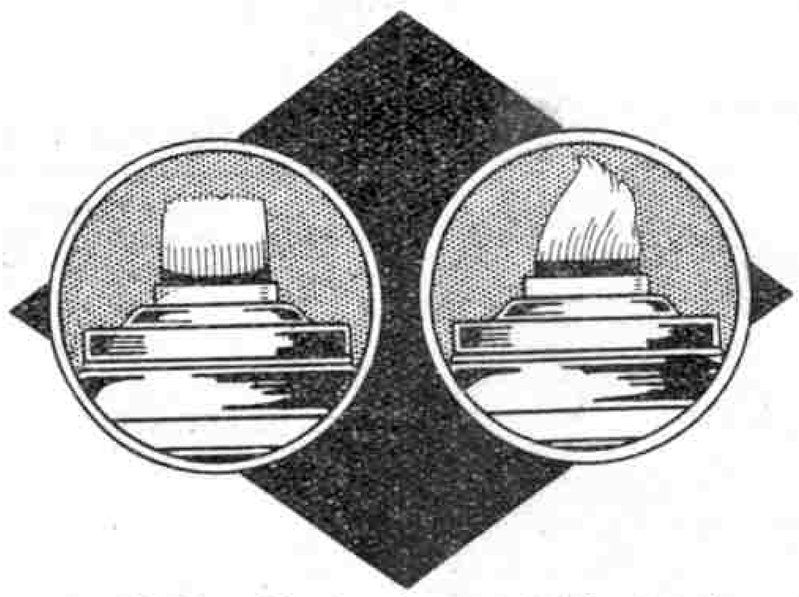
The illuminating powers of electric cycle lamps, of course, are infinitely less than those of acetylene lamps, and they are satisfactory only if used for short periods, as the battery is then able to recuperate in the intervals. This type of lamp is therefore far more suitable for town use than on long country journeys.

In another kind of electric cycle lamp, which is also used by some motor-cyclists, the current is generated by means of a small dynamo connected to the front wheel. The light is, of course, extinguished when the machine stops, but it is not dependent on the erratic behaviour of a battery, which is liable to run down at a critical moment.

Acetylene Lamps

For the rider who requires a very powerful light, however, the acetylene lamp is by far the best. These lamps burn acetylene gas, which is generated by water dripping on to calcium carbide, obtained either from a separate generator or from a generator combined with the lamp. In the former case, the generator may be fixed to a suitable part of the frame and the gas conveyed to the burner by means of a length of rubber tubing. There is no danger of explosion with these lamps, as provision is made for the escape of superfluous gas through the upper compartment, or water reservoir. Acetylene lamps cost more in fuel and require more attention than oil lamps, but these disadvantages are more than equalised by the steady and powerful light that they give.

A USEFUL LAMP HINT



A wick trimmed level produces a pointed and smoky flame. Trim it concave, and a steady, level flame is the result.

Stamps for Sale

(*See also page* 338)

FREE. 17 Unused Pictorial Ukraine to applicants for approvals.—Harland, Dean Road, Scarborough.

NYASSA PACKET FREE with Approvals, ½d. and 1d. each.—Bodman, 6, Alderman Road, Ipswich.

Advanced Stamp Exchange Club. Few more members wanted.—Sec., 23, Hampton Pk., Redland, Bristol.

IRISH STAMPS. 100 mixed obsolete and current, bargain, 1/4.—Lawe, Park Avenue, Old Trafford.

WATCHES FREE. Write for Stamp Approvals and obtain full particulars.—Moorgate Trading Co. (Dept. 4), Moorgate Chambers, London, E.C.2.

100 Varieties, 1/2 ; Foreign and Colonial, 66 to 80 per cent, under catalogue ; 1d. blacks ; approval.—Rev. Bell, Loughguile, Co. Antrim.

ALL BUYERS from my approvals will receive FREE Gifts. Send for selection now. You will not be disappointed.—Negus, Bury, Huntingdon.

GENUINE BARGAINS. Selling off. 100 Foreign Colonial Stamps all different, 1/2 Postal Order. 250 2/2. Worth 10/-.—Scott, 154, Wellesley Road, Ilford.

NONE FREE—NONE AS CHEAP ! ! Farthing Stamp Approvals ; about 1000 sent.—J. V. Wyk, 439, City Road, Old Trafford, Manchester.

FREE ! 100 Different to those sending postage and asking to see Approval Sheets.—C. Florick, 179, Asylum Road, London, S.E.15.

About 400 Foreign and Colonial sent on approval. Select 50 for 1/-.—Woodruff, 9, Burgoyne Road, Harringay, N.4.

BRITISH COLONIALS FREE. 12 different, including set ½d.—1/- to all approval applicants sending postage. —Gaze, Didsbury, Manchester.

60 DIFFERENT STAMPS FREE to applicants for approvals. All ½d. each. 60 for 1/3.—Cox, 135, Cambridge Road, Seven Kings.

Approvals—Mainly Colonials ; liberal discount ; sent to reliable collectors.—Stamford, 9, Richmond Hill, Blackburn.

SPECIAL CLEARANCE of old approval sheets. 7 Cochin free to applicants for a selection.—S. Huckle, 53, Birkenhead Avenue, Kingston-on-Thames.

FREE ! 50 Genuine Foreign Stamps, including set Azerbaidjan, sent to all who write for my cheap Approval Sheets.—C. F. Blake, "Hillcrest," 120, Holland Road, Willesden, N.W.10.

BRITISH COLONIALS (all different), 100, 8d. ; 150, 1/2 ; 200, 2/6 ; 250, 3/9 ; 500, 12/-. **Selections on approval from ½d. each.**—Berry, 269, Coldharbour Lane, Brixton, London, S.W.

STAMPS. Large number mint and used British Colonials, also Persian and other foreign at bargain prices. Selections choice copies, priced separately, on approval.—Collector, 31, Kensington Gardens, Bath.

250 STAMPS, 5½d. Alexandria, Dahomey, Montserrat, etc. 100 Neurope, 6d ; 100 Austria-Hungary 6d. ; 50 Colonials. 6d.—White, 98, Bushey Hill Road, Peckham.

75 STAMPS, 4½d. Caymans, Angola, Grenada, Nigeria, Mozambique, etc. 500 assorted stamps, 9d. 40 United States, 9d. ; 10 Philippines, 5d. ; 10 Siam, 6d.—Brooks, 43, Edmund Street, Camberwell, Eng.

MARVELLOUS VALUE ! Packets catalogued over £2, for 1/6 ; 15 different Irish, high values, 1/3 ; approvals 50 a 1/-. Free gifts for postage.—Chas. Lock (Dept. M.), 5, Groundwell Road, Swindon, Wilts.

FREE 2 UNUSED WEMBLEY to all purchasers over 1/6. 100 diff. Stamps, 4d. ; 300, 1/2 ; 40 French Cols., 6d. "Everyland" Album, 1/9 ; "Victory," 2/9 ; 1000 Mounts, 6d. ; All post free.—R. Edmondson, Queen Street, Morecambe.

BRITISH COLONIALS.—125 different, catalogued 25/-, excellent condition, including sets Iraq, Ireland, Jamaica, Malay, Mauritius, Ceylon, Straits, Trinidad, Tobago, Newfoundland, for 3/-.—Palmer, 105, Sefton Park Road, Bristol.

8 CHINA "SHIP" 1c. to 10c. Free to approval applicants. Having changed address, old sheets marked down. Send P.C. to-day. Set of 5 1911 Persia, 1 ch. to 6 ch. post free 3d.—R. A. Clipston, 11, Cromwell Avenue, Bromley, Kent.

ANYTHING TO SELL?

This Space is set to ½ inch s.c. and costs 5/- per month. This sum is the 64th of £16, the price of a whole page advertisement. 55,000 copies of the Dec. number were issued and distributed all over the world. You therefore reach this exclusive public at the rate of one penny a thousand.

LATEST ISSUES. LOWEST PRICES.

110 different, including Ascension, Jamaica 3d. Pictorial, Nauru Pictorial, Persia, Bulgaria, Sudan, Barbados, Cuba, free 3d. if approvals desired, without 6d. 10 different Iceland, 5d.—Morris & Co. Stamp Dealers, Bletchley.

FREE. HUNGARY PACKET FREE. Splendid Set **Hungary** (Pictorials, Cat. over 1/6). Very Old **Set Austria. Irish Free State.** Set **Old German** (including Pictorial). Japan. **Czecho Slovakia.** Poland, etc. This **Valuable Collection** Free to all asking to see my approvals.—**Paterson, 19, Dorset Avenue, Rusholme, Manchester.**

FREE !

12 China-Japan and 25 British Colonials, including W Africa, Newfoundland, Travancore, Jamaica, Queensland. To applicants for my famous approvals, enclosing 1½d. postage. 250 Unused Stamps, 1/3.—**FLEMING, St. Winifreds, Christleton Road, Chester.**

WEMBLEY STAMPS

All for 1/-. **Unused WEMBLEY STAMPS,** 50 diff. stamps (cat. over 4/6), a Watermark Detector and Perforation Gauge, and 100 Mounts, to all sending 1/- and 1½d. postage.—J. Pickering, Market Place, Holt, Norfolk, England.

SOMETHING FOR NOTHING

All applicants for my better-class approvals, **sending postage,** may select one of the following : **All Mint :**—Set of War Charity Stamps—British Colonial, face 3d. and cat. 1/-. Packet of 50 different.

A customer writes, "I may say that I have done business with many stamp dealers, but never have I been so satisfied as I have been with the selections you have sent me." If you wish to be in the running, write now, stating countries interested in. I make a speciality of British Colonials. List of albums, accessories and special offers free on request.

P. A. Westbrook, St. Benet's, Westgate-on-Sea.

MORE BARGAINS ! ! !

(Continued from last month). 30 Argentine, 9d. ; 12 Barbadoes, 7d. ; 50 Bavaria, 7d. ; 20 Chili, 7d. ; 10 Cochin (Large), 5d. ; 30 Denmark, 5d. ; 65 France, 9d. ; 100 Germany, 6½d. ; 50 Hungary, 3½d. ; 40 Italy (Cat. 3/10), 7d. ; 10 Jamaica, 3½d. ; 20 Peru, 1/3 ; 25 Roumania, 5d ; 20 Siam, 1/1 ; 40 Sweden, 6½d. ; 30 Swiss, 6d. ; 19 Travancore, 5½d. ; 50 Wurttemberg, 1/-. Postage extra. All different. Good condition, and money refunded if not satisfied. Write for List N31. The Western Imperial Stamp Co., 46, Drynham Road, Trowbridge, Wilts., Eng.

BRITISH INDIA. ¼a to 3 rupees.

Set of 10 Indian stamps, in use during 3 reigns (¼a to 3 rupees), various issues, GIVEN FREE of charge to applicants for approval sheets. (Special discount to Agents). If 2d. postage is enclosed either a set of PICTORIAL ASCENSION ISLAND (new issue) or Mesopotamia or 1,000 STAMP MOUNTS also given FREE, or the 3 sets and stamp mounts for 6d. postal order.

TURNER, 88, East Hill, London, S.W.18.

MARGOSCHIS BROS., 25, Lower Temple St., BIRMINGHAM.

Makers of Stamp Packets for 40 years, offer you :

300 Stamps, all different for 1/- ; 500 for 2/- ; 1,000 for 6/- ; 2,000 for 25/- ; 50 different French Colonials, 1/- ; 100 do., 2/3 ; 200 do., 5/6 ; 50 Bulgaria, 1/3 ; 50 Bavaria 1/3 ; 20 Greek, 6d. ; 50 Indian States, 1/6 ; 30 Norway 6d. ; 50 Roumania, 1/6 ; 55 Russia, 1/3 ; 24 Ukraine, 6d. ; 60 Czecho Slovakia, 1/6. Every stamp in every packet is different. Marvellous value.

MARGOSCHIS BROS. (*Dept. M*), **25, Lower Temple Street, BIRMINGHAM.**

NO NEW EUROPE

FREE. 25 BRITISH COLONIALS and 10 S. American, including W. Africa, Newfoundland, Travancore, Jamaica, Queensland. To applicants for my famous approvals, enclosing 1½d. postage. 250 Unused Stamps, 1/3.—**FLEMING, St. Winifreds, Christleton Road, Chester.**

"THE PHILATELIC MAGAZINE," 46, Victoria St., London, S.W.1. Best stamp newspaper. Order from your newsagent. 3d. fortnightly, or send 4d. for specimen and bonus form worth 2/6. Album catalogue free.

BRITISH COLONIALS, 200 different, 3/9 ; 500, 15/- ; 1000, 55/- ; or a selection sent on approval at ½d. each. Colonial Mixture including high values, 3/- per 1000.—Theobald, 54, Antill Road, London, N.15.

FREE PICTORIALS FREE

To all applicants for my bargain Approvals I am presenting absolutely FREE a Monster Pictorial Packet containing New Issues, Airpost, etc.

Write to-day and you will be delighted. Every 5th applicant also receives packet Mounts.

L. C. JONES,

61, West Street, Bourne, Lincs.

WILL YOU ACCEPT

A NICE COLLECTION. 150 DIFFERENT CATALOGUED UP TO 10/- EACH.

These are quite free to buyers of 2/- or more from my cheap approvals. No charge for postage or packing. Please send 6d. deposit and deduct from your purchase.

D. ENTWISTLE, 7, John Street, Sale, Cheshire.

INCQMPARABLE STAMP PACKET

contains about 1,000 mixed stamps, 20 British Colonials, 20 mint stamps and set 10 Philippines, post free 1/3.—Bickers, Lordswood Avenue, Southampton.

UNUSED STAMPS AT FACE VALUE. Advertiser has a quantity of unused stamps which have been received in payment from our Colonies and several foreign countries. Assorted lots will be sent for face value and postage. Send 1/1½, 2/7½ or 5/1½ and stamps to value will be sent by return. When required, special countries will be sent, but this cannot be guaranteed. Enquiries invited.—Box No. 102, *Meccano Magazine.*

Free Set of Poland

Splendid Set of 7 unused Polish Stamps free. Send 2d. for postage and packing to

A. F. Langton, 37, Allison Road, Harringay, London, N.8.

Look out for my special Xmas offer next month.

FREE TO MECCANO READERS

A specimen copy of "THE STAMP COLLECTOR," the popular and helpful monthly journal. This old-established magazine, now in its 28th year, is a great favourite in the five parts of the Globe. It contains the most comprehensive chronicle of newly-issued stamps and the advertisements of all leading dealers. JUST SEND NAME AND ADDRESS on a post card and you will get a copy. **DO IT NOW.**

MARGOSCHIS BROS. (*Dept. M*), **25, Lower Temple Street, BIRMINGHAM.**

Round the World

The pages of the "*M.M.*" offer you a world-wide market. For a small charge of 10/- per column inch (2¼ inches wide), your advertisement is brought to the notice of thousands of potential customers each month. An advertisement in the "*Meccano Magazine*" will be read by over 100,000 readers in all parts of the world.

Rates and Specimen Pages on request.

Advertisement Manager,

"*Meccano Magazine*"

BINNS ROAD LIVERPOOL

How Wireless Valves are Made

(*Continued from page* 333)

at too high a temperature or in some cases through too high a voltage having been used on the anode. The effect has been that the thorium on the surface of the filament has been used up more quickly than it was being produced, hence the loss of emission. In these cases matters may be readjusted by running the filament at its normal voltage for about half-an-hour with no high tension on the anode, when the emission becomes as strong as formerly.

When the ageing process of dull-emitters has been completed, the valves are passed through some stringent tests. In one the total emission is measured, and in another a very delicate test is applied to ensure that the vacuum is of a very high order. This test ensures that there is no more than a certain minimum of pressure of gas in the valve. Finally, every valve is tested on a receiving apparatus, under actual operating conditions. The valves that have been passed as perfect are cleaned and etched and then packed ready for sale.

Some Useful Details

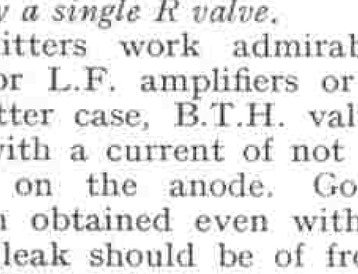
Dull-emitters mark a great advance in valves for Radio reception, for they make it possible to draw the necessary filament current supply from a dry battery, such as is used in ordinary circuits. Working on three volts, the actual consumption of the B.T.H. B5 valve is only 0.06 amperes. This means that the power consumed is 0.18 watt, as compared with three watts frequently required by valves of the "R" type. By using dull-emitter valves, therefore, it is possible to work a four-valve receiver on *less than half the current required by a single R valve.*

Dull-emitters work admirably, either as H.F. or L.F. amplifiers or detectors. In the latter case, B.T.H. valves should be used with a current of not more than 40 volts on the anode. Good results have been obtained even with 20 volts. The grid leak should be of from two to five megohms. Used as an amplifier the anode potential may be increased up to 80 volts, but when over 40 volts are used a negative grid bias voltage is recommended. This should be of a value of about –3 volts when 60 volts are used on the anode, and of –6 volts when 60 to 80 volts are used.

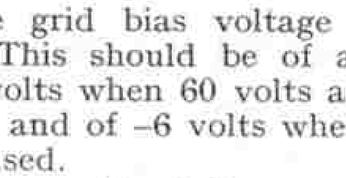
(*The End*)

New Meccano Parts

We have pleasure in announcing the undermentioned new parts, supplies of which are now available.



No.
27b. Gear Wheel, 3½", 133 teeth each 1/6
103k. Flat Girder, 7½" ... half dozen 1/3



144. Dog Clutch ... ... complete 6d.

Would You Risk It?

Photo courtesy] [*Messrs. Ding's Magnetic Separator Co.*

This man is suspended from a magnetic pulley by its attraction for the nails in his boots! (See article *Magnets in Industry*, page 322)

Metal Casting at Home

We hear that the ingenious moulds for metal-casting at home advertised in our columns by Messrs. A. Rodways (102, Long Street, Birmingham) are increasing in popularity. Many new moulds have been added to those available last season, and a boy would indeed be hard to please who could not find something to interest him among the varied collection. The new large-sized moulds of various wild animals are particularly good and there is a wide range of soldiers on foot and on horseback, hunters, Red Indians, etc. Using old lead pipe or scrap, perfect castings can be turned out with these moulds with very little trouble, failure being almost impossible.

A Useful Coat

The great difficulty in choosing a winter overcoat is that one never knows what the weather is going to be like. One day it may be wet and bitterly cold and next day fine and warm. Messrs. Curzon Bros. Ltd. (33, New Bridge Street, Ludgate Circus, London, E.C.4.) have dealt with this problem in their well-known "Cebedene" Trench Coats by providing a detachable wool fleecy lining. The coat itself is guaranteed to be absolutely waterproof, and the lining may be used or removed according to the weather, so that the garment, besides being smart in appearance, is one of all-round utility. The coats are made in various sizes to suit either boys or men, and further particulars will be found in our advertising pages.

Useful to Model-Builders

A catalogue of interest and value to every boy interested in electricity or model-building is issued by Mr. A. W. North, of 47, Parchment Street, Winchester. The list contains almost every conceivable accessory that could be required for experimenting, and any article not listed will be obtained within three days. Enquiries are invited, and a copy of the list will be sent post free to any reader mentioning this Magazine.

A Stamp Tour Round the World

(*Continued from page* 339)

On our way southward from Guadeloupe to Martinique we pass the British island of Dominica, which must not be confused with the Republic of the same name. All Dominican stamps issued from 1903–1922 (except the high values) show the island as seen from the sea. These stamps are of very handsome design, which design has appeared in many forms. The first issue (1903) was on paper watermarked with a Crown and the initials CC. This issue remained in use until 1907, when the stamps were printed on paper watermarked multiple Crown CA. In 1908 there was another re-issue in the regulation colours of the Universal Postal Union. Previously all values except the ½d. had been in two colours. In 1908, however, they appeared in single colours (except the 2/– value) and the ½d. appeared in blue-green instead of green. During the War there were various surcharges and overprints, and in 1921 several values appeared on the new paper with the script watermark. Dominica was discovered by Columbus on a Sunday in 1493 and accordingly was named by him Dominica, from the Latin *Dies Dominica*.

NEXT MONTH:—

THROUGH THE PANAMA CANAL.

Storage Boxes for Meccano Parts

These boxes, which are very suitable for holding Meccano parts, are made in polished oak, fitted with partitions, and hinged lids. They fasten with lock and key, and are provided with two drawers also with locks and keys.

The dimensions of the boxes are 17" × 15" depth 9¼", and the price is each 70/–, carriage forward.

We have only six of these boxes in stock and we advise those of our readers who are interested to take immediate advantage of this opportunity of securing a strong and serviceable box for storage of their Accessory Parts.

MECCANO LTD. LIVERPOOL

BOND'S LATEST MODEL

FIRE PAILS for Model Railway Stations.

Scale, Gauge "O"

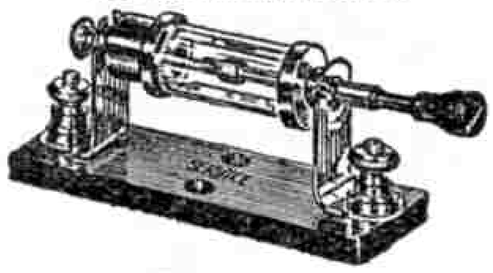
Buckets, 2½d.
Brackets, 1½d.
Send 4d. for Bond's Model List, or 7d. for Sample of Bucket and Bracket with Price List.

BOND'S LTD., 254, Euston Road, N.W.

Use a SERVICE Detector

and get the maximum amount of satisfaction.

Crystal replaced in a few seconds, NO SOLDER BEING REQUIRED.
Not affected by vibration.



Patented Micrometer Adjustment
(Prov. Pat. No. 15224/24).

Glass enclosed and dustproof. Spring for holding crystal in place. Highly polished nickel-plated or gold lacquered finish. Undoubtedly finest value obtainable.

Obtainable at all Wireless Stores.

Price **2/6.** *For Panel Mounting* **2/-.**

SERVICE RADIO CO. LTD.,
67, Church Street, Stoke Newington.
LONDON, N.16.

STAMMERING

Cured or No Charge. Particulars **Free.**
FRANK A HUGHES.
7, Southampton Row, London, W.C.1.

VARIABLE CONDENSERS

Complete sets of boxed parts, including ebonite dial, panel screws, diagram, etc.

.001 m.f.	...	8/9	.0002 m.f.	...	5/6
.0005 ,,	...	7/–	.0001 ,,	...	5/–
.0003 ,,	...	6/–	.00005 ,,	...	4/9

Intermediate Capacities at proportionate rates. With knob and ivorine scale 6d. less per set. Post Free.

LEEDHAM, Dept. C, Belton, Uppingham, Rutland.

BLUSHING **SELF-CONSCIOUSNESS, SHYNESS.** Simple 7-day **Permanent** Home Cure for either sex. No Auto-suggestion, drill, etc. **Send only 1½d. stamp.** Mention *Meccano Magazine.*
M. C. DEAN, 12, All Saints Rd., ST. ANNES-ON-SEA

YOU
can build a £40 Gramophone with our Scale Drawings and Fittings for **40/-.**
Our Large Illustrated Catalogue of Gramophones, Motors and Tonearms, etc., will interest you. Post Free 2d.

Harmony Gramophone Co.,
366, York Rd., London, S.W.1

STAMMERERS

or their parents, should write for my 36-page booklet. Sent free to those seeking genuine cure.
Lee Wareing, Dale Avenue, Bispham, Blackpool.

HOBBIES' FAMOUS DEPÔT

35, Manchester Street,
LIVERPOOL.

Three Things Well Done:
Fretwork
Meccano
Wireless

A FEW WIRELESS LINES:

Bare Copper Aerial ...	... 1/8 & 2/2
Headphones	...from 10/–

All best makes in stock.

Cabinets, all shapes ...	... from 3/9
Lamp Batteries ...	per doz. 4/6

Price List Free. Postage extra.
Money returned for goods not approved.
Don't forget the address:
35, MANCHESTER ST., LIVERPOOL.

BULLI-MONTIL
CYCLE
Electric Light Set

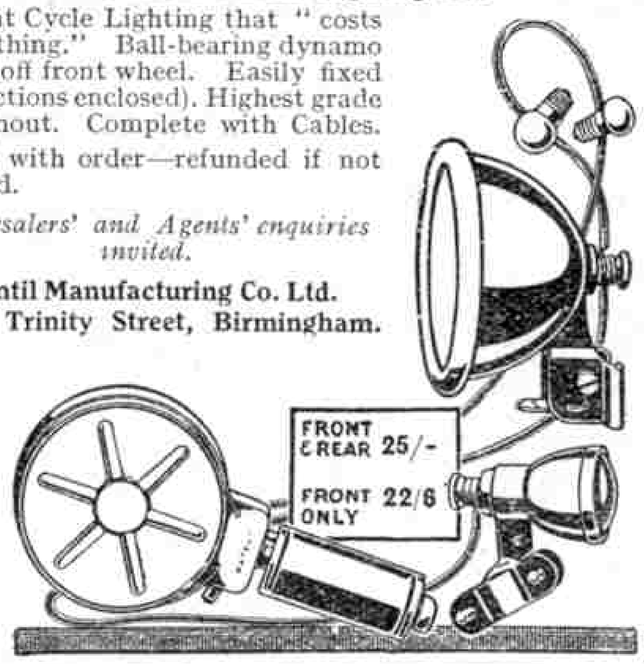
The World's BEST Lighting Set.

Brilliant Cycle Lighting that "costs you nothing." Ball-bearing dynamo driven off front wheel. Easily fixed (instructions enclosed). Highest grade throughout. Complete with Cables.

Cash with order—refunded if not satisfied.

Wholesalers' and Agents' enquiries invited.

Montil Manufacturing Co. Ltd.
Lower Trinity Street, Birmingham.



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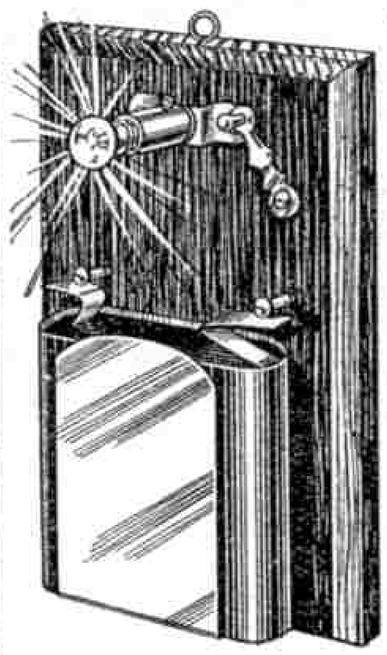

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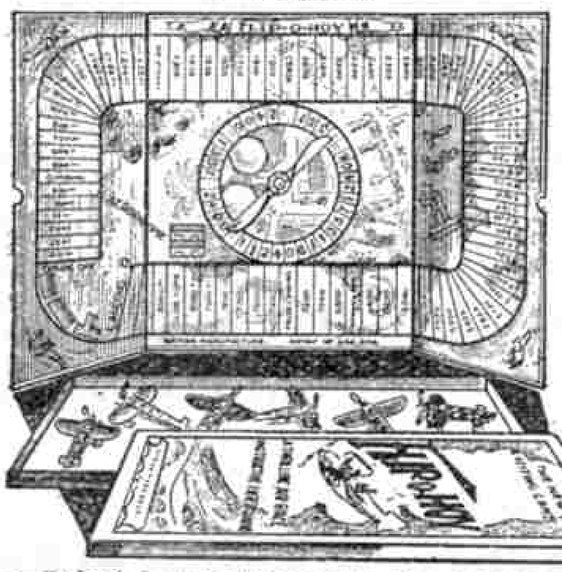

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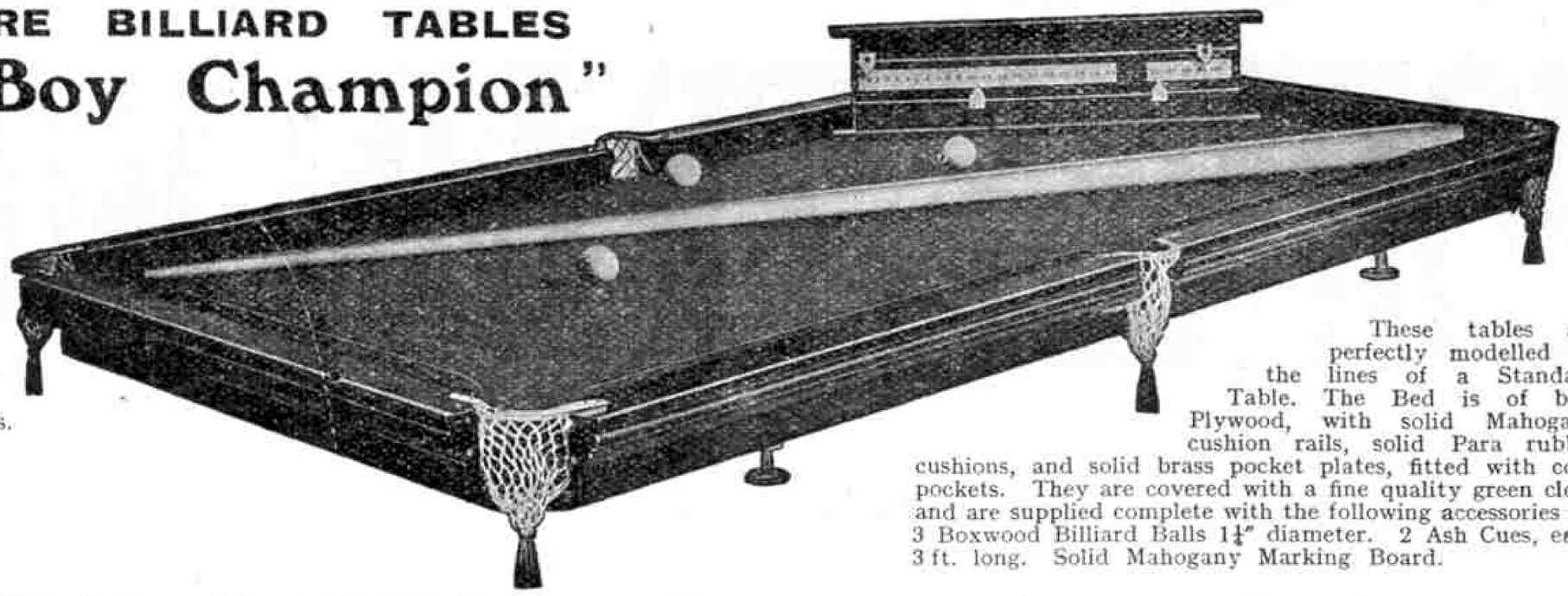

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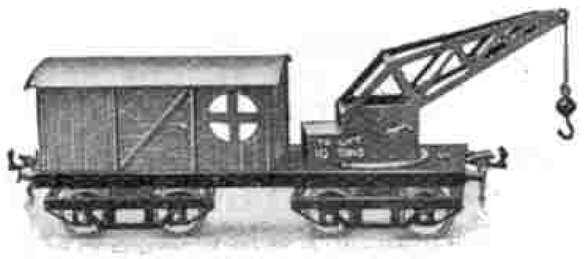

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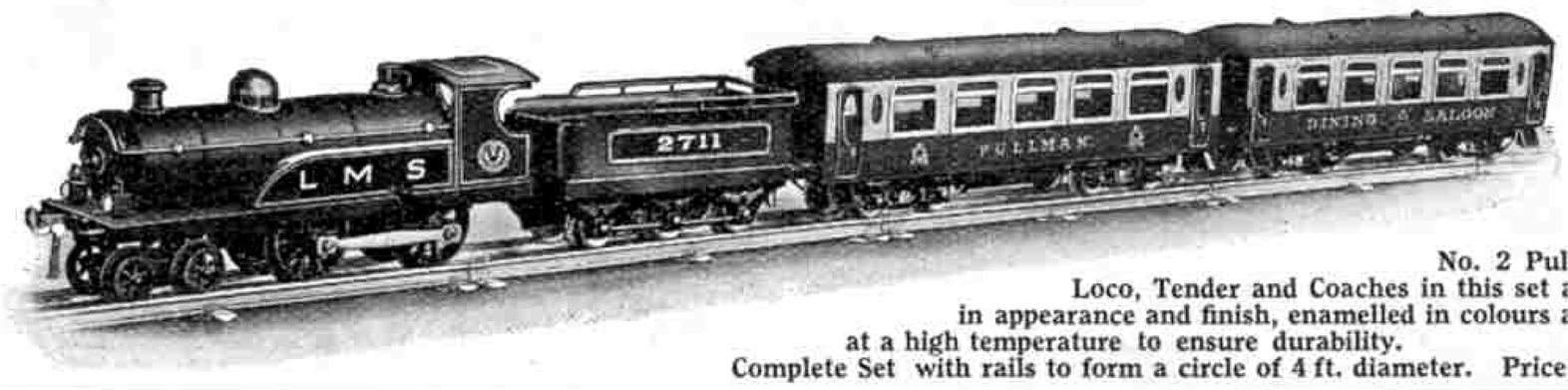

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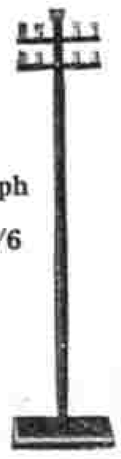

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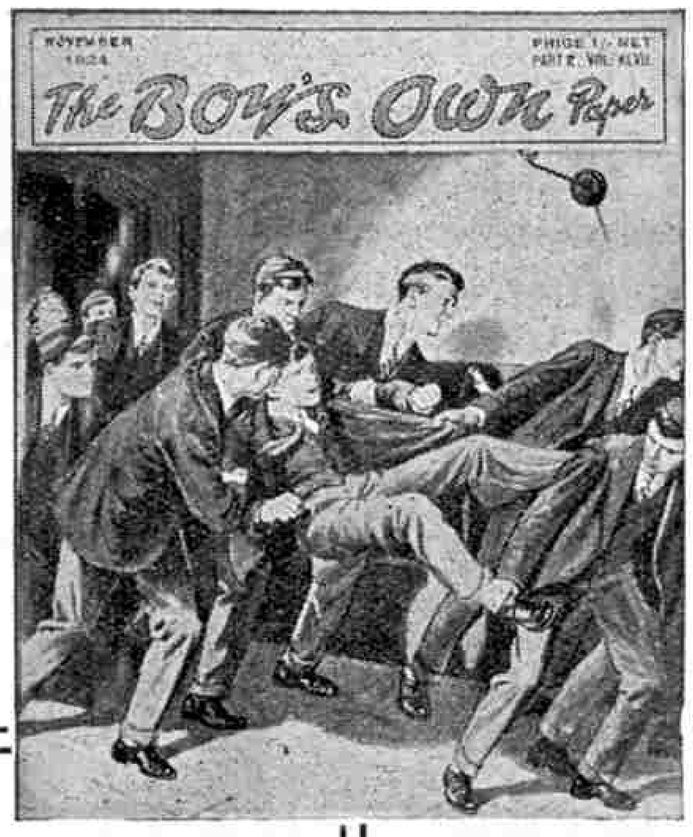

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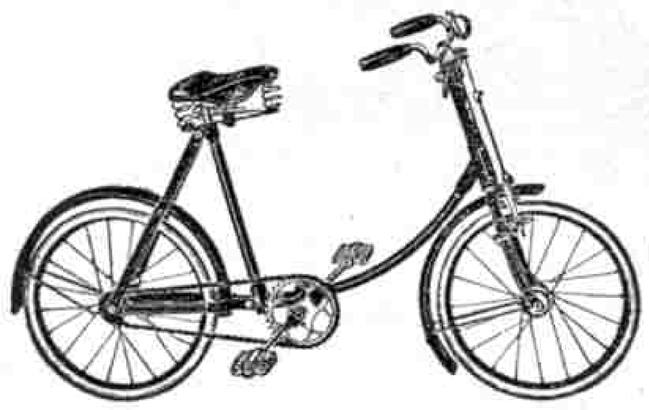

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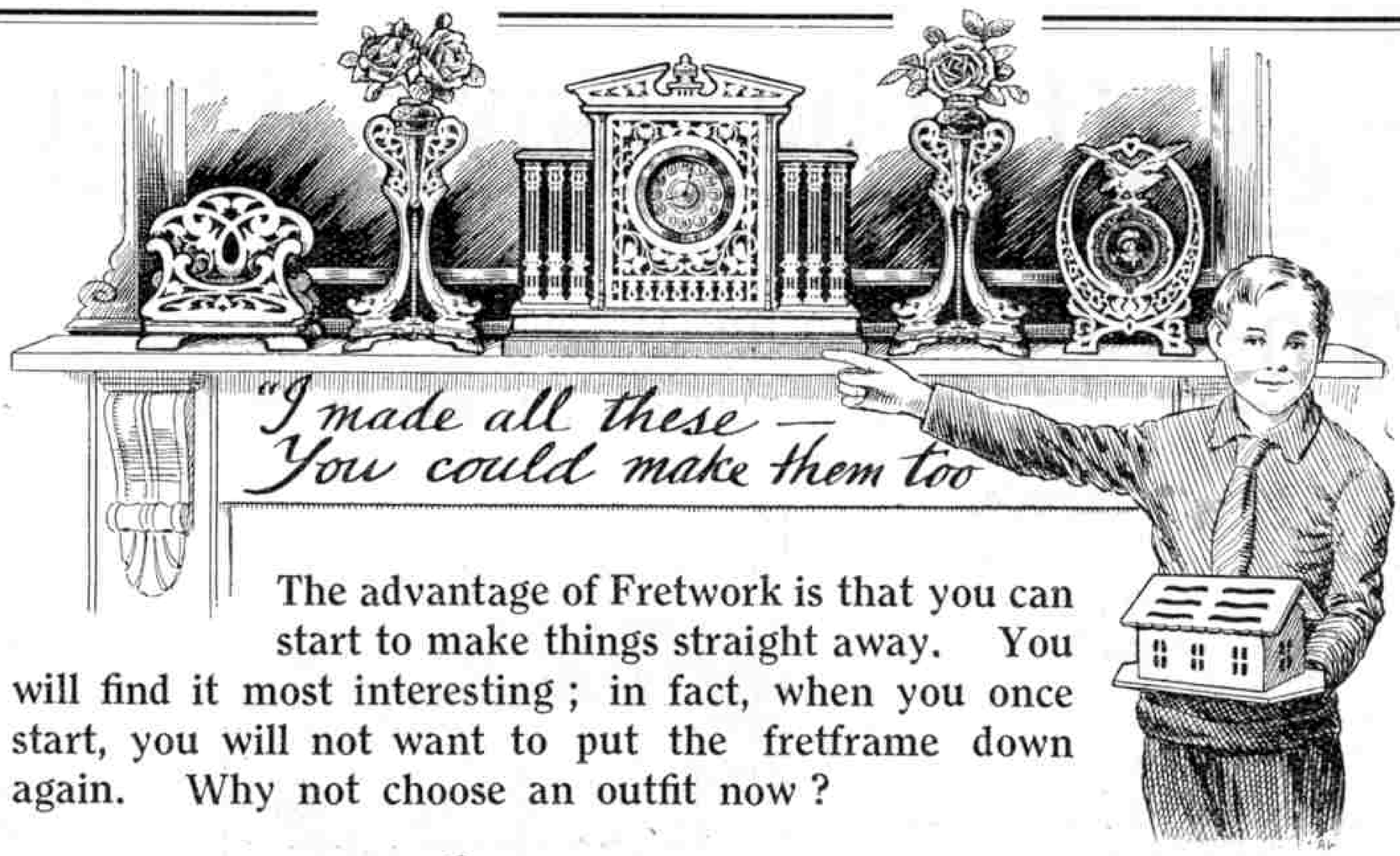

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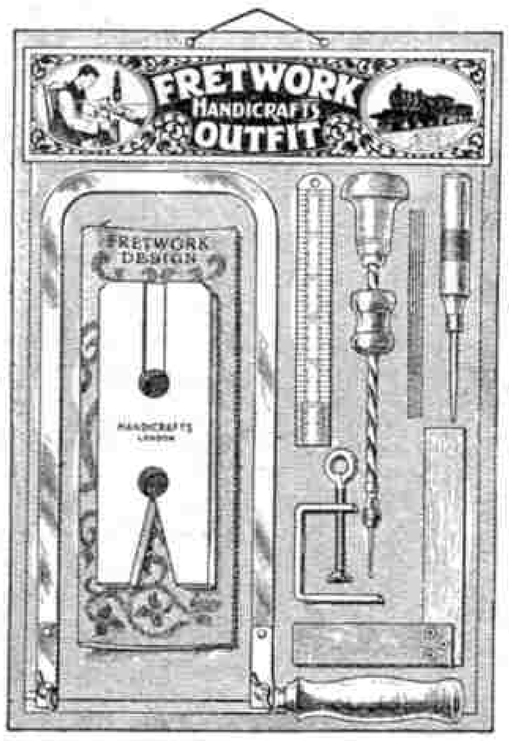

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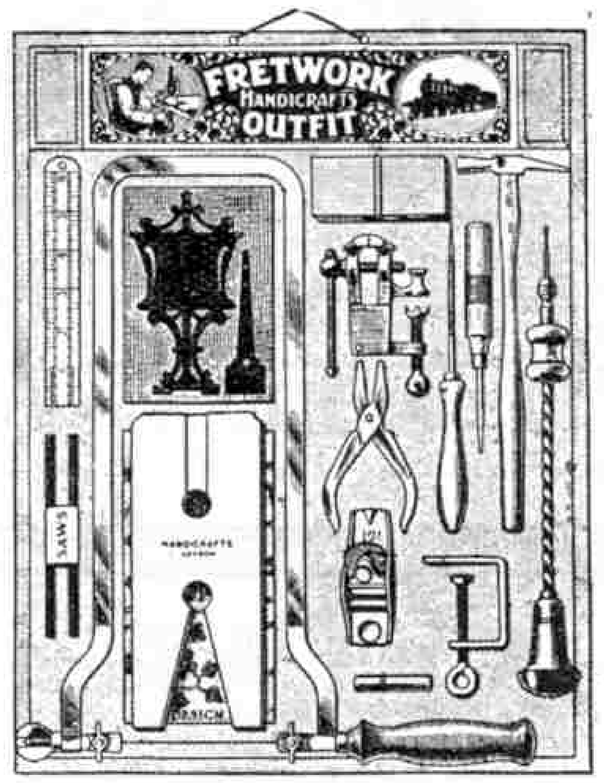

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Shepherds Bush : 72, Uxbridge Rd.
Poplar : 263, East India Dock Rd.
Gravesend : 13 & 14, Milton Road.
Grays : 71 & 73, High Street.
Brighton & Hove : 66, George St., Hove.
Southend-on-Sea : 99, High Street.
Westcliff-on-Sea : 117, Hamlet Court Road.

TWO SPORTY TOYS FOR CHRISTMAS.

THE NEW AUTO-SCOOTER

Known all over the World
and

THE SPRING-FRAME CYCLE

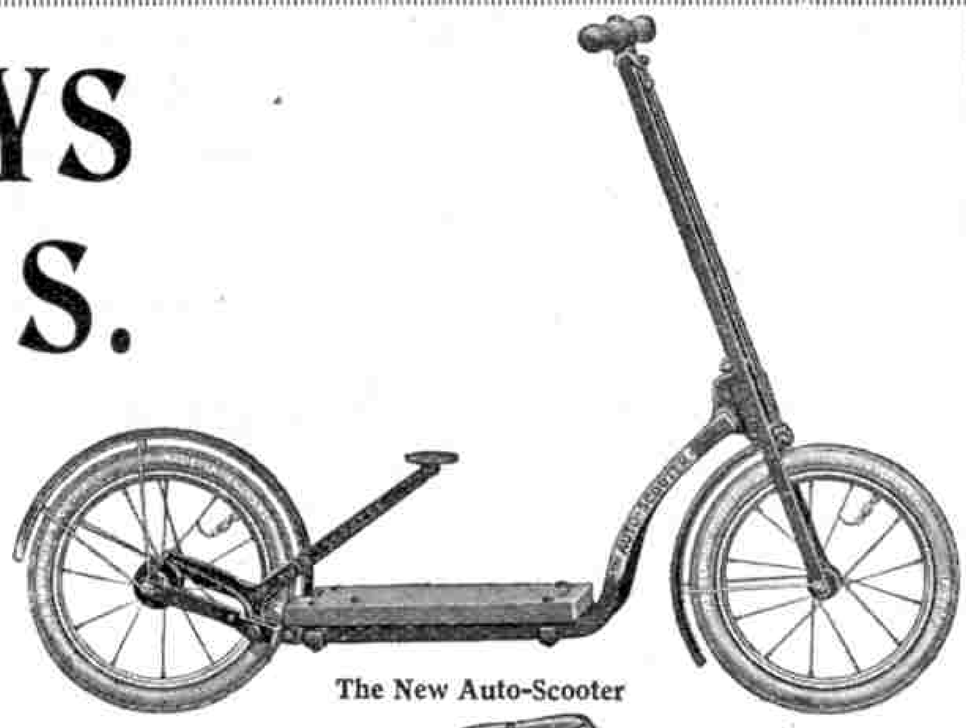
Our New Patented Miniature Cycle.
None like it on the Market.

ASK YOUR TOY DEALER
TO SHOW THEM TO YOU

The New Auto-Scooter Co.,

CHESTERGATE, STOCKPORT

'Phone : 2713. 'Grams : "Autoscoot."



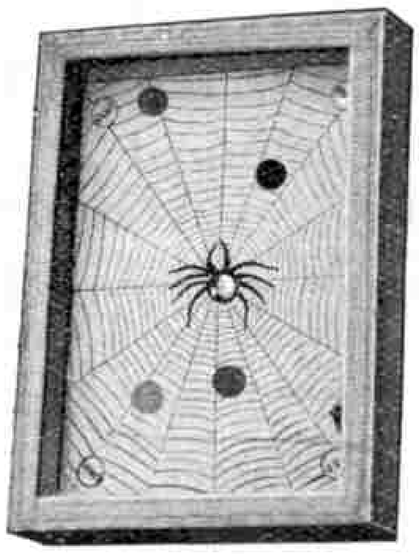
The New Auto-Scooter

The Spring-Frame Cycle

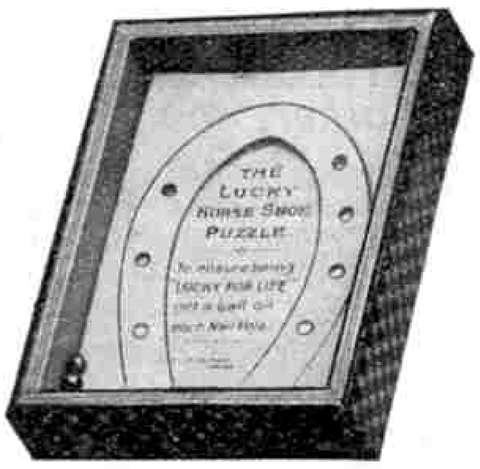
R. JOURNET, PUZZLE EXPERTS,

201a, Harrow Road, LONDON, W.2.

Pioneers of Popular Portable Practicable Puzzles, Proving Positively Perplexing and Perpetually Pleasing. Palpable Posers or Persistently Portentious and Provokingly Ponderous Problems Providing Profuse Pleasure, and Producing a Palliative or Placid Panacea to Particular Persons Possessing a Propensity for Patience, Persistent Perception and Precious Painstaking Propensities.

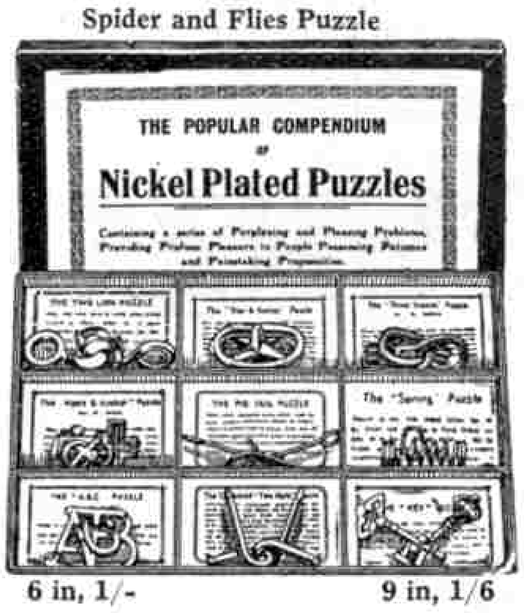


Spider and Flies Puzzle



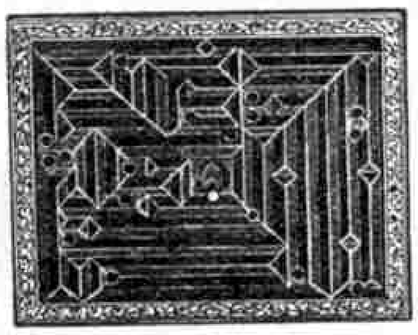
Wiggle-Woggle Puzzle

All Puzzles are well finished in glass-top wood boxes and gilt bordered.



6 in, 1/- 9 in, 1/6

May be had of all Stores, Toy Dealers, Stationers, etc., or will be sent post paid for 1/- each.



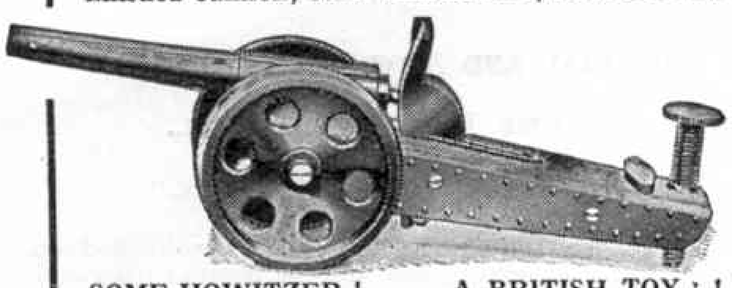
Subway Puzzle

SEND FOR ILLUSTRATED CATALOGUE

It Bangs! Flashes! and Shoots!

No Caps, Powder, or Special Ammunition.

Practise and Beat Father with this beautifully finished Cannon, built with Bronze, Steel & Brass



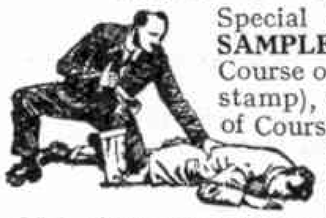
SOME HOWITZER! A BRITISH TOY!!

4/9 post free.

Money returned if you do not approve.

HANWELL'S TOYS,
38, Alexandra Road,
NORTHAMPTON.

DON'T BE BULLIED



Special offer. **TWO ILLUSTRATED SAMPLE LESSONS** from my Complete Course on **JUJITSU-JUDO Free** (enclose stamp), or 3/6 for MONSTER Portion of Course. Jujitsu is the **best** and simplest science of self-defence and attack ever invented. Learn to take care of yourself under ALL circumstances and learn to protect the small and weak. **SEND NOW—"YAWARA" SCHOOL (Dept. M.C.), 10, Queensway, Hanworth, Feltham, Middlesex.**

MAKE GRAMOS.

Our 32 page Catalogue tells you for **2d. how to do it** and what accessories to choose. **Motors** in 25 sizes, from 9/– Tone-arms, 4/–; Speakers, 2/–; Headphones, **10/6** pair; Cabinets from 9/–. Gramophones from 30/–. Carr. paid. **The Regent Fittings Co., D.78 120, Old St., London, E.C.1.**

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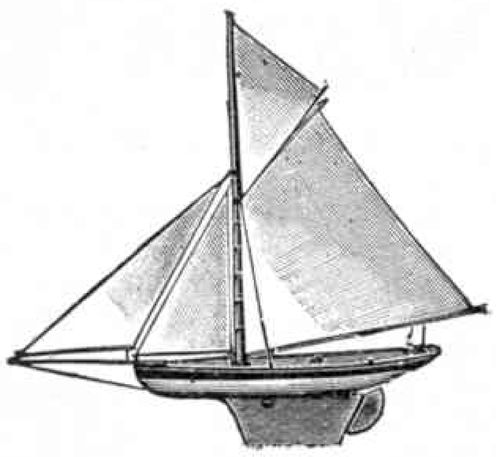
and all interested in magic, must write for our catalogue of **REAL TRICKS.** Stamp for List.

MAGICAL MART,
17, Alston Buildings, Spiceal St., Birmingham

KENSINGTON MODEL DOCKYARD



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MOTOR & STEAM LAUNCHES
ELECTRIC & MECHANICAL TOYS
CINEMATOGRAPHS CAMERAS
INDOOR GAMES CUTLERY & TOOLS
OUTDOOR SPORTS FRET OUTFITS
AIR GUNS FISHING TACKLE
HORNBY TRAINS
MECCANO OUTFITS & PARTS
Always in Stock.

Send 1½d. Stamp for List "M."

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185, Kensington High St., London, W.8.

Home Cinematographs
Films and Accessories

Our New Illustrated List Now Ready. Copy will be sent, post free, on receipt of post card. Machines from 7/6, Films from 1/– per 100 ft., post free.

Enquiries promptly attended to.

FORD'S (Dept. M.M.), **13, Red Lion Sq., London, W.C.1** (Entrance, Dane St.)

MECCANO WIRELESS BOYS

YOUR CRYSTAL IS IMPORTANT.

Our Crystal is EXTRA LOUD and sensitive all over. Generous TESTED specimen post free 11d. from

WEBB & GOWARD,
Caxton Street, Market Harborough.

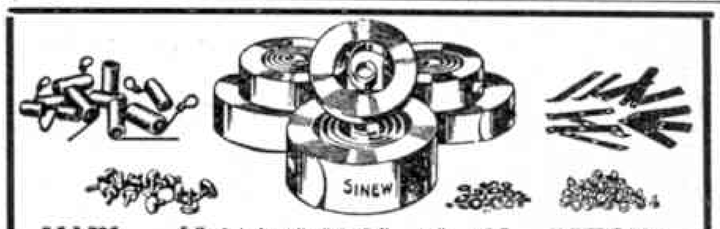
BOYS MAKE YOUR OWN LEAD SOLDIERS.

Cowboys, Indians, Animals, Zulus, Model Station Staff, Rodeo, etc. Our CASTING MOULDS make thousands from any scrap lead WITHOUT PREVIOUS EXPERIENCE. Send stamp to-day for illustrated catalogue.
Complete mould ready for work 2/6.
RODWAY, 102, Long St., Birmingham
Mention "Meccano."

MECCANO BOYS, READ THIS!

Films, 100 ft. 10d., post free. 1,000 ft. 5/9, post free. Cinemas from 5/6, postage 6d. Electric Motors from 3/6, postage 4½d. Vertical Steam Engines 3/3, postage 6d. Electric Trains 9/–, postage 9d. Scale Model Lathes, capable of actual work 10/–, postage 9d. Brownie Wireless Sets 7/6, postage 6d. Footballs, size 5, 5/9, postage 4d. Diana Air Guns 4/9, postage 9d. Senior Diana Air Guns 12/–, postage 1/–. Meccano Outfits and Parts at list prices. Hornby and Zulu Trains at list prices. Wireless Parts, Headphones, etc., etc., at rock-bottom prices. Send for lists.

Radio Co., 34, Church Street, West Ham, E.15.
Telephone: Maryland 2148.



MAIN SPRINGS 5/8" 2/6, 11/16" 2/8, 3/4" 2/9, 7/8" 3/3, 1" 4/–, 1¼" 7/– each. **REPAIR OUTFIT as shewn 25/–**
Ask Trade. CLARKES (M.M.) Spring Experts, Redditch, Eng.

DO YOUR OWN REPAIRS AND SAVE MONEY

The S.E.T. Quick Action Flexible Cement.

Quick acting, waterproof, will not crack or break away.

Will unite any dry, clean material in a few seconds, no mess, no waiting, no trouble, will keep indefinitely, waterproof, not brittle.
Will join Ebonite, Wood, Metal, Cloth, Rubber, Paper, Waterproof material, Leather, Celluloid, Glass, etc., etc.
Just the cement for innumerable jobs in the home or workshop.
Invaluable for Experimenters, Amateur Mechanics and Handy People generally.
Send 1/6 postal order for ample supply, post free.

The STANDARD ENGINEERING TOOLS CO. LTD. (Dept. M.),
25, Laurence Pountney Lane, LONDON, E.C.4.

MAKE YOUR OWN ELECTRIC LIGHT

5/- These wonderful Dynamos—unlike Batteries, etc.—will work for years and years without attention or renewal. They light brilliantly 4–6 volt lamps and are very easy to work. They can be used for many purposes and all "Meccano Boys" will find them of particular interest. GREEN'S unapproachable price—5/– POST AND PACKING FREE.

Special **"De Luxe"** model, larger and giving nearly three times the output of our 5/– size, 10/– POST AND PACKING FREE. **"Super De Luxe"** model, larger still and giving nearly five times the output of our 5/– size, **15/–** POST AND PACKING FREE.

GREENS (Dept. A.N.), 85, New Oxford Street, London, W.C.1. **5/-**

CUT THIS OUT. 'Meccano' Pen Coupon, Value **3d.**

Send 5 of these coupons with only 2/9 direct to the **Fleet Pen Co., Fleet Street, E.C.4.** You will receive by return a splendid British 14-ct. Gold Nibbed Fleet Fountain Pen value 10/6 (Fine, Medium, or Broad Nib). If only 1 coupon is sent the price is 3/9. 3d. less for each extra coupon up to 4 (Pocket Clip 4d.). Satisfaction guaranteed. Your own name gilt letters, either pen 1/– extra.
Lever Self-Filling Model with Safety Cap, 2/– extra.

—THE SUPER ONE-VALVE SET—

Has received all B.B.C. and CONTINENTAL STATIONS. Loud Speaker results possible. Simple to operate. Marvellous range and Power. **37/6,** plus Royalties. (Genuinely worth £4). Buy the world's Best NOW. Thousands of letters of appreciation arriving from all parts of the Country.

SATISFACTION ASSURED!

World's Wireless Stores, Wallington.

BEGINNER'S GUIDE TO WIRELESS

This book gives more practical information about building wireless instruments than others at ten times the price. **HOW TO ERECT, CONNECT AND MAKE** all kinds of wireless apparatus, including crystal and dual amplification sets, and two-valve amplifiers, also the latest two, three and four valve tuned anode receivers. 160 pages including diagrams.
Saxon Radio Co. (Dept. 32), South Shore, Blackpool.

1/3 post free

Readers' Sales & Wants

If you have anything to sell or wish to buy anything, take advantage of the service offered by a small advertisement in these columns.

The "*M.M.*" is read by approximately 100,000 people every month. It circulates in every country where the English language is spoken. If you wish to sell your duplicate stamps, your rabbits, or your tools, or to purchase a loud speaker, a steam engine, a model yacht, or a hundred-and-one other things, you will be able to do so through the columns of the "*M.M.*"

The rates are one penny per word, with a minimum of 1/- (cash with order).

Your advertisement must be received before the 10th of the month for insertion in the following month's issue.

If a Box Number is used, 4d. should be added to cover the cost of postage of the letters to the advertiser from this office. The letters will be posted one week after the advertisement appears, and a second batch a month after the advertisement appears. They will be sent more frequently if additional postage is in cluded with the advertisement.

IMPORTANT.—Advertisements dealing with any article in the current Meccano catalogue cannot be accepted.

PLEASED ADVERTISERS

LIVERPOOL.—"*Your Magazine has brought me much better results than other papers.* Through the *Meccano Magazine* I have had mail orders from South Africa, Australia and the West Indies." H.W.R.

ALFRETON.—"We are getting far more enquiries than is usually the case." N. & Co.

MANCHESTER.—"Up to the present, results have been entirely satisfactory." N.M.P.

LONDON, W.C.1.—"*I have had more satisfactory results from my advertisements in your paper than in all the other papers combined in which I advertise.* In nearly every case, each new customer has resulted in one who buys regularly from month to month." A.K.

S. WOODFORD.—"I have already obtained good customers from my last small advertisement." G.P.C.

LEYTON.—"I obtained excellent results from my advertisement in your paper." L.A.S.

UPPER NORWOOD.—"As the result of this advertisement I have received 50 enquiries, including one from Italy." A.C.M.S.

KENTISH TOWN, N.W.—"I have not repeated my advertisement, because *the number of replies was so great that I could hardly cope with them.* I have now made arrangements for dealing with a larger demand and shall be glad if you will insert the enclosed advertisement in your next issue." E.G.

READERS' SALES

(*Rate: 1d. per word, min.* 1/-).

Four-Valve A.J.S. Wireless Receiver for sale. Complete set with all accessories, condition good as new, just overhauled by makers. Cost £27, take £15, or £10 without accessories.—Box 51, c/o *Meccano Magazine*, Liverpool.

For Sale. Powerful Hot Air Engine, 1½ in. bore cylinders, metal castings, 7 in. heavy flywheel, mounted on polished wood base, 18 in. × 9 in. 30/-. Exchange considered.—Apply Sawyer, 25, Inverness Street, Sunderland.

Steam Locomotive with complete set of rails, points and crossings, will sell cheap. Apply J. M.Cullough, Glengormley, Belfast.

4-volt Dynamo, Wire, Bulb, Lampholder, cost 7/6. What offers?—R. Reeves, Seabreeze, Prinsted, Emsworth.

Structo Model Working Tractor and Trailer, perfect condition, cost 58/-. What offers?—Townsend, Fruiterer, King's Cross, Halifax, Yorks.

Stamps. 50 Egypt and others, 7d. 50 English, 7d. 50 Colonials, 7d. All different.—W. Jones, Ravensworth Cottage, Cheltenham.

For Sale. 200 Model Soldiers, made by Britain's Ltd., including such famous Regiments as the Black Watch, Scots Guards, 12th Lancers; also Guns, Forts, etc. What offer? Write for particulars.—L. Feltham, Haye, Lyme Regis, Dorset.

Steam Locomotive and Track, Gauge 1. Almost unused. Inspection.—Simpson, 72, Kempton Road, Wavertree.

For Sale. Hawk-Eye Camera, splendid condition.—J. Fielders, Old Bank House, Atherstone.

1,000 Well-mixed Stamps, 1/3, post free.—Smith, 108, Brewer Street, S.E.18.

Gibbons' Ideal Album Folio, 1168 stamps. Many old imperforate issues, including block of 12 old Spain 1864, etc. Unique bargain, £3. Approval deposit only. "Captain," Vol. XLI., unbound, 3/-.—Hill, 66, Hilderthorpe Road, Bridlington, East Yorks.

Exchange Stamps. Your country—mine.—Ray Price, Cambria Park, Papatoetoe, Auckland, N.Z.

SMALL ADVERTISEMENTS

(*Rate:* 1-/ *per line*).

Gent.'s Strong Nickel Keyless Watches, 4/11 post paid (worth double).—Banks, Drub Lane, Gomersal, Leeds.

Patents Advice, Handbook and Consultations Free. B. T. King, C.I.M.E., Regd. Patent Agent, 146a, Queen Victoria Street, London, E.C.4. 38 years' reference.

RARE CHANCE. Reducing collection Old English and Roman Silver and Bronze Coins. Cheap lists. State wants.—"Appleton," 53, Albany Road, Coventry.

EDISON 4 minute Blue Amberol Phonograph Records, reduced prices. New goods now arriving. Lists.—A. Robinson, 333, Hainton Avenue, Grimsby.

Gent.'s 9-carat Gold Watch, 15 Jewel Lever Movement, **£5/10/-** post paid **(guaranteed).**—Banks, Drub Lane, Gomersal, Leeds.

NIGGER MINSTREL WIGS, 9d. each. 2 Tambourines, 1/8 each, post free.—A. R. Mannall, 12, Lansdowne Circus, Leamington.

"MODEL RAILWAY CONSTRUCTION," 300 pages, 400 illustrations, a wonderful book. 6/6 post free.—Greenly, Ashley Road, Farnboro', Hants.

LIVING STICK INSECTS, Large Exotic Spiders, Aquarium Beetles, Ova, Larvæ and Pupæ, etc. Stamp.—Rose, Alexandra Road, Tonbridge.

MODEL PETROL MOTOR CASTINGS, ½ H.P., **9/9** purchases Top-Hole Model Castings with Cylinder bored. Catalogue 3d.—Madison Motor Co., Wade Avenue, Littleover, Derby.

CATAPULTS.—Powerful, accurate, and reliable weapon, complete with 50 rounds ammunition, 1s. 9d., posted; silent Walking Stick Catapults, Air Guns, elastic, etc.—Young's, M., Net Makers, Misterton, Som.

Constructors' Sets of Parts for 2 Valve Sets; has received America; guaranteed components; ebonite drilled; 48/6, royalties extra.—Bates, Wireless Depot, Bellevue, Redruth, Cornwall.

CINEMA FILMS.

SALE—HIRE—EXCHANGE, also Machines, Re-winders and Accessories. Good Sample Film, **1/-** Post Paid.

LISTS FREE.

Filmeries, 57, Lancaster Rd., Leystonstone, London, E.11

CINEMATOGRAPHS CHEAP.—Monster Lists, 100ft. Film 1/- posted.—Pictures, 109, Kenlor Rd., Tooting.

FILMS CHEAP. 100 ft. sample 10d. Projectors and Accessories. List.—Don Cinematograph Supply, 96, High Street, Penge, S.E.20.

CINEMATOGRAPH FILMS, Machines, Accessories, Bargains. 100 ft. Film and List 1/-.—Tottenham Film Exchange. Offices, 2, Ascot Rd., S. Tottenham, N.15.

CINEMA FILMS, MACHINES, ACCESSORIES; 100 ft. film and lists, 1/-; Stamp brings Wireless lists. —J. Humphreys 40, Davenant Road, London, N.19.

Home Cinema Films for sale, Cheap.—Sewell, Burton Bradstock, Bridport, Dorset.

Blushing, Self-Consciousness, Nervous Timidity. Genuine Cure. No exercises. Send only 1½d. Stamp. F. A. Hughes, 7, Southampton Row (B57), London, W.C.1.

MECCANO MAGAZINE

Registered at G.P.O., London, for transmission by Canadian Magazine Post.

EDITORIAL AND ADVERTISING OFFICES:—

BINNS ROAD, LIVERPOOL.

Telegrams: "Meccano, Liverpool."

Publication Date. The "*M.M.*" is published on the 1st of each month and may be ordered from any Meccano dealer, or from any bookstall or newsagent, price 2d. per copy. It will be mailed direct from this office, 1/6 for six issues and 3/- for twelve issues (post free). The price of the December issue is 3d., post free 4d.

To Contributors. The Editor will consider articles and photographs of general interest, payment will be made for those published. Whilst every care will be taken of those submitted, the Editor does not accept responsibility for any loss or damage. A stamped addressed envelope should be sent where it is desired that the contribution should be returned if unacceptable.

Binding Cases. Spring-back Binders to take a number of "*M.M.'s*" are supplied, covered with imitation leather and lettered in gold, price 3/- each (post free).

Meccano Writing Pads. Fifty sheets of tinted bank paper, each printed with Meccano boy at head, 1/3 (post free).

Advertisements

Readers' Sales and Wants. Private advertisements (*i.e.*, not trade) are charged 1d. per word, minimum 1/-. Cash with order. Editorial and Advertising matters should not be dealt with in the same letter.

Small Advertisements. 1/- per line (average seven words to the line), or 10/- per inch (average 12 lines to the inch). Cash with order.

Display. Quotations for space bookings, and latest circulation figures, will be sent on request.

Press Day, etc. Copy must be received not later than 10th of each month for publication in following issue. Half-tone blocks up to 100 screen.

Remittances. Postal Orders and Cheques must be made payable to Meccano Ltd.

Obtaining the "*M.M.*" Overseas

Readers Overseas and in foreign countries may order the *Meccano Magazine* from regular Meccano dealers, or direct from this office. The "*M.M.*" is sold Overseas at 2d. per copy, or mailed (post free) direct from Liverpool, 1/6 for six issues, or 3/- for twelve issues.

IMPORTANT.

Overseas readers are reminded that the prices shown throughout the "*M.M.*" are those relating to the home market. Current Overseas Price Lists of Meccano Products will be mailed free on request to any of the undermentioned agencies. Prices of other goods advertised may be obtained direct from the firms.

CANADA: Meccano Ltd., 45, Colborne Street, Toronto.

AUSTRALIA: Messrs. E. G. Page & Co., 379, Kent Street, Sydney.

NEW ZEALAND: Messrs. Browning Ifwersen Ltd., P.O. Box 129, Auckland.

SOUTH AFRICA: Mr. A. E. Harris (P.O. Box 1199), Textile House, Von Brandis St., Johannesburg.

COLOUR PLATES OF LOCOMOTIVES.—Magnificent lithographic pictures printed in eleven colours, size 20" × 12". L.M. & S. Railway, Caledonian No. 956 and L. & N.W. No. 1407 (L/Cpl. J. A. Christie, V.C.), L. & N.E. Railway, Great Northern No. 1470, Great Western Railway No. 4061 (Glastonbury Abbey). Price 1/- each. By post, in tube, 1/2. The set of four, post free, 4/2.

M. Dept., Railway Magazine, 33, Tothill Street, London, S.W.1.

WATCHES

Genuine sturdy Swiss, beautiful movement, good for a lifetime, and splendidly accurate timekeepers. Send 6/6 and yours by return.

GREENS (Dept. A.N.), 85, New Oxford St., London, W.C.1

Ask Father to get you one of these toys—they are just like the 'grown ups' use—only smaller

The FAIRYCYCLE

(Registered Trade Mark)

Built like a Bike—but safer

The Fairycycle ensures beneficial exercise so necessary for good health and strength, and gives hours of innocent amusement.

Be sure the word "Fairycycle" and Triangle Trade Mark are on the frame. None genuine without. British made.

Note the low centre of gravity which makes the Fairycycle so safe and easy to ride.

Specification—Adjustable plated handle-bar, cycle saddle (adjustable), ball-bearing rubber pedals, 12 in. wheels with ⅝ in. wired-on tyres, frame of solid drawn weldless steel cycle tube, brake and free wheel.

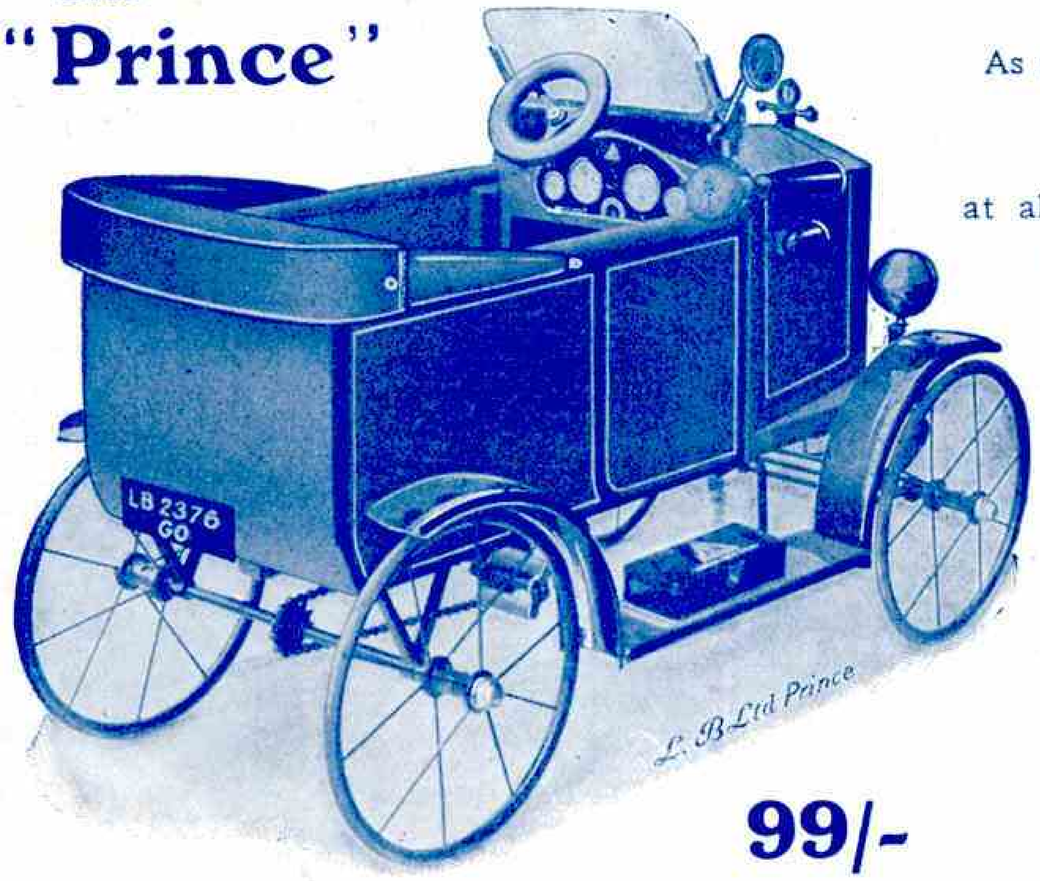
See the famous Triangle Trade Mark on all Good Toys and avoid spurious imitations.

As illustrated, only

59/6

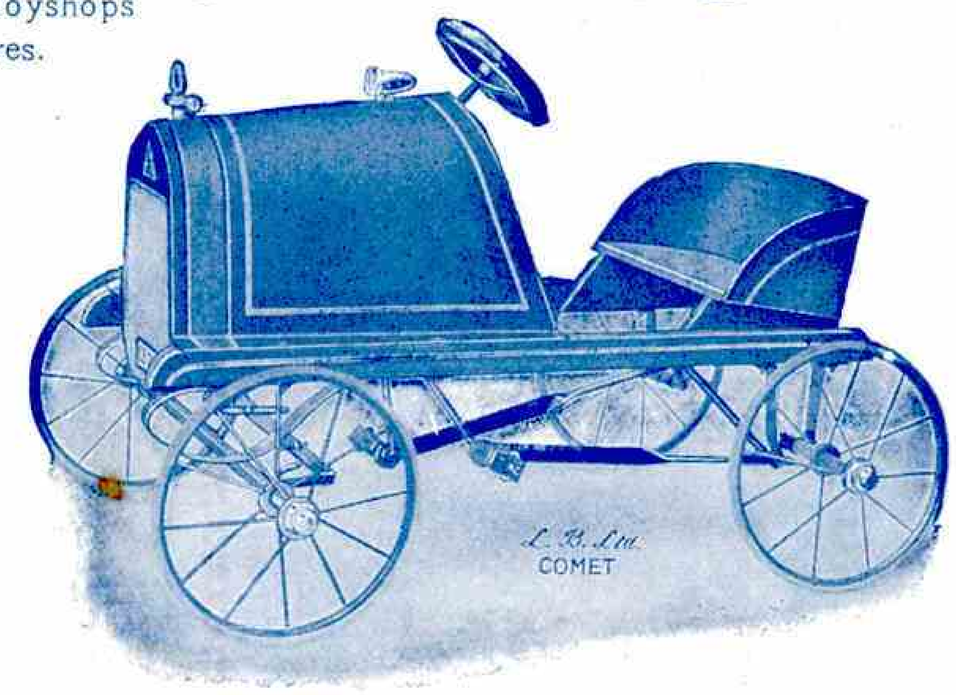
at all good Toyshops and Stores.

The "Prince"



99/-

This luxurious model with the Rolls-Royce type radiator has everything the heart can desire, including instrument board with clock, speedometer, oil indicator and voltmeter, dummy hood and "stop" and "go" signal, tool box, etc., 12 in. wired-on tyred wheels. Suitable for children up to 10 years.



The "Comet"

A very natty Auto for the speed merchant. It has a double crank movement, 10 in. wired-on tyred wheels, lamp, etc. For ages 2—7 years.

27/-

See the famous Triangle Trade Mark on all good Toys and avoid spurious imitations.

Wholesale only from

LINES BROS. LTD., 9, Fore St., London, E.C.

Still the Nation's Leading Store for Boys

GAMAGES

With the Winter months before us, the question of how to spend the evenings becomes one of first importance. Here are a few good things from Gamages which, we think, will make the dullest of evenings *really enjoyable* If what you want is not on this page, come and see it at Holborn—nothing is missing from this Great Store for Boys !

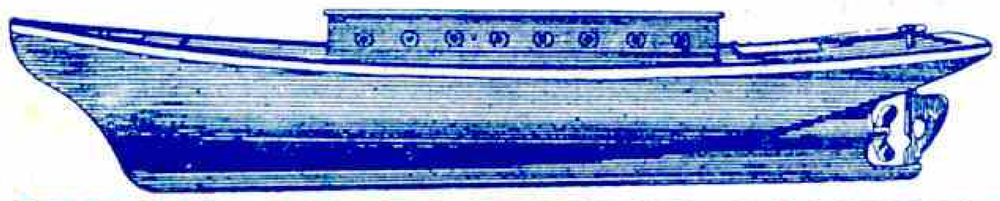
CHEMISTRY!

Chemistry makes a splendid hobby—so why not take it up this Winter ? At Gamages you can buy a complete set of Chemicals for **3/3** and start right away.

Neat Box of Chemicals with instructions, etc., complete for performing 50 experiments. Order one to-day Price ... **3/3** Post 6d.

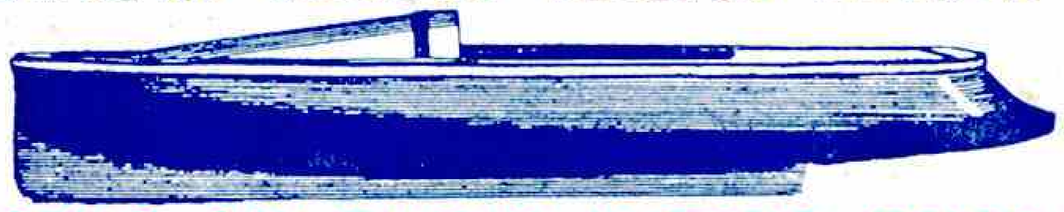
Ditto with instructions, etc., for performing a larger number of experiments. Price complete **5/6** Post 6d.

MODEL STEAM LAUNCHES, etc.



STEAM OR ELECTRIC LAUNCHES

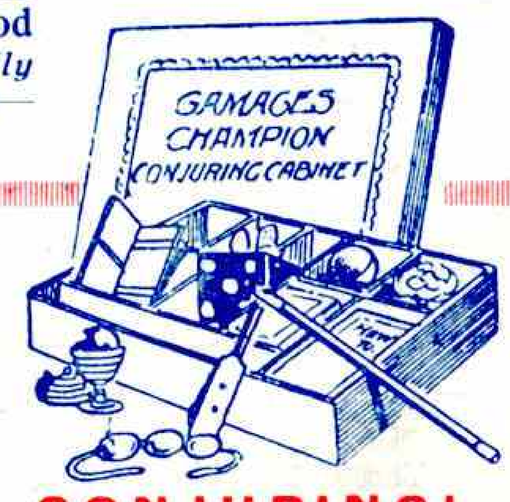
(Without machinery). Carved from best flawless yellow pine, with long hatch to take machinery. Mahogany fittings. Beautifully finished and enamelled, as illustration, 24 in. long. Price **31/-**
27 in. long, **38/6** 30 in. long, **48/6** 33 in. long, **58/6** 36 in. long, **72/6**



THIS SPLENDID MOTOR BOAT

(Without machinery). Carved from the best flawless yellow pine, long hatch, mahogany fittings, turtle deck, beautifully enamelled, 24 in. **36/6**
27 in., **42/6** 30 in., **49/6** 33 in., **62/-** 36 in., **72/-**

These Motor Boats and Launches can be fitted with electric motors or steam engine, as required, at extra cost according to size and quality.



CONJURING!

The Big Feature of Parties, Concerts, Club Meetings, etc., this year is (so the experts tell us) to be conjuring. Why not get a box of Conjuring Tricks from Gamages and mystify your friends ? You'll find it a most interesting hobby. Gamages offer a grand assortment of startling tricks complete with box and instructions for ... ... **3/-** Post 4d.

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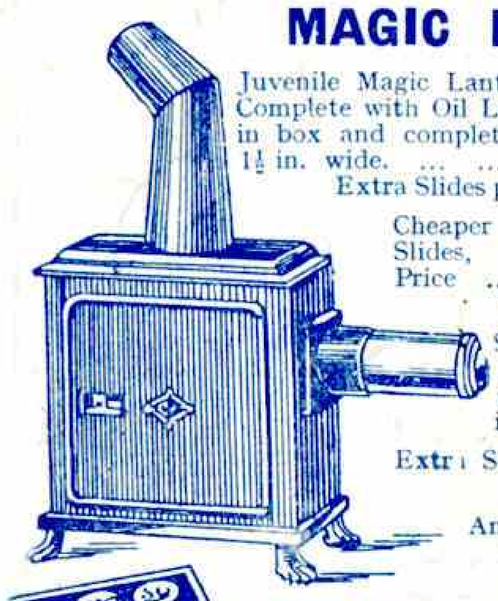
Our New Cinematograph and Magic Lantern List is now ready and may be had post free on request.

Cinemas Complete from ... **5/6**

MAGIC LANTERNS



Juvenile Magic Lanterns, metal throughout. Complete with Oil Lamp and Glass. Packed in box and complete with 3 Slides, 1½ in. wide. ... ... Price **5/9**
Extra Slides per box of 12, **10d.**

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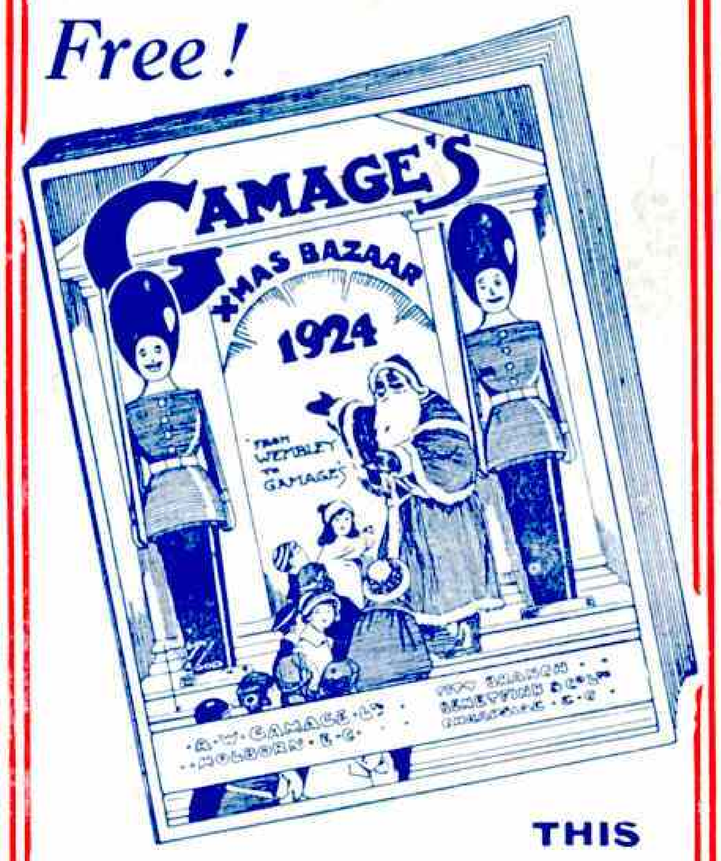

THIS

MONSTER ILLUSTRATED XMAS BOOK

is Yours for the Asking !

Preparations for the Greatest Xmas Bazaar of all times are now in full swing at Gamages. Meanwhile, to give you an idea of the wonderful things to be seen shortly, Gamages have compiled this huge Xmas Catalogue. There are barely enough to go round, but we want all "Meccano" Boys to have a copy, so send for yours now and be on the safe side.

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OFFERED FOR 7/6

Another very good hobby for the Winter is Wireless. You will never complain of the dull evenings with this splendid set installed in your house. Illustrated is the "Brownie" Crystal Set, with solid moulded ebonite cap and highest grade nickel fittings. British throughout, it is made to operate 4 pairs of 'phones. Sold ready for use. Price **7/6**

'Phones and Aerial Outfit extra.

This set has recently been altered and now embodies all the latest improvements.

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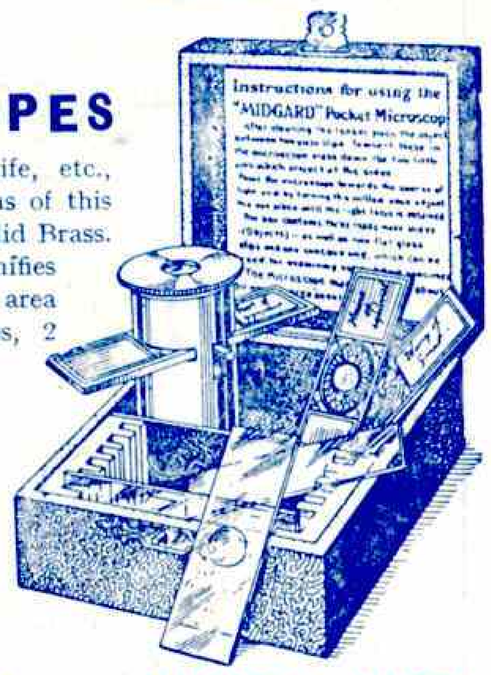
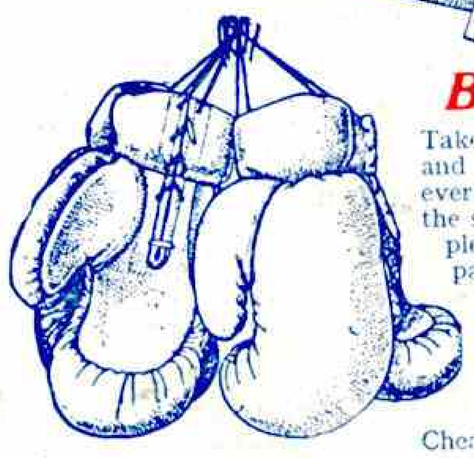


BOXING!



Take up Boxing this Winter and keep fit. You can get everything you require for the sport at Gamages. Complete set of Gloves, laced palms, bar grip, stuffed horsehair. Boys' Sizes. Per Set **13/6**
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